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OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Vol. 204 No. 4 | Domestic $6 per Annum, 25c per Copy; Canada $7.04, Foreign $7.56 | JANUARY 22, 1931 | Published Weekly in Boston at 165 Newbury Street

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The Massachusetts Medical Society

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VOLUME 204 JANUARY 22, 1931 NUMBER 4

NEW ENGLAND SURGICAL SOCIETY

ATELECTASIS*

BY CARLETON R. METCALF, M.D.†

ATELECTASIS is popularly known as collapse of the lung but, to a certain extent, this is a misnomer. One should, at any rate, differentiate it from the type of collapse that one sees, for example, in pneumothorax, where the lung is knotted up in the region of the lung root. In atelectasis, on the contrary, the lung tissue migrates or is pushed toward the chest wall and assumes a condition of airlessness similar to the airlessness of foetal life. I shall consider primarily the massive type of atelectasis in which one or more lobes are involved.

For the sake of clarity, one may assume that this condition is due to obstruction of a bronchus either from within or without. As soon as the normal flow of air has been stopped the alveolar air is absorbed by the blood stream and collapse ensues.

Some of the conditions which cause obstruction from without the bronchus are chronic inflammatory disease like tuberculosis, aneurism, tumors, fluid in the pericardial or pleural sacs and elevation of the diaphragm such as occurs in postdiphtheritic paralysis. Some of the conditions which plug the lumen of a bronchus and thereby cause obstruction from within are foreign bodies, syphilitic stenosis and the presence of blood clot following injury or of tenacious mucus following pneumonia.

In all of these conditions atelectasis has been noted and while the bronchial obstruction may not be the sole cause it is certainly the most important one.

Postoperative atelectasis belongs in the last named group for it is due to the presence of tenacious mucus in a bronchus. It occurs chiefly as a sequel of abdominal operations but it has been reported after thyroidectomy and after hemorrhoidectomy and it may occur after spinal as well as after general anesthesia.

When atelectasis is complicated by bronchial or pulmonary infection, the symptoms of collapse are masked by the underlying disease. In postoperative cases the symptoms are more clear cut. Here atelectasis resembles embolism, pleural effusion or pneumonia. In fact, it has been stated that 70% of the postoperative pneumonia cases are really instances of atelectasis. One may expect a sudden onset, not very stormy, two or three days after operation. There is no chill and little pain. The temperature rises, perhaps, to 102°, dyspnea and cyanosis are noticeable and there is a cough with mucopurulent sputum.

The signs are retraction and immobility of the chest wall with dullness on percussion. There are early diminished breath sounds with diminished vocal and tactile fremitus. Later (or occasionally throughout) one finds bronchial breathing and increased fremitus. Finally, and most important of all, there is cardiac displacement towards the affected side due to an increase in intrapleural negative pressure. One even finds displacement of this sort where atelectasis and pleural effusion coexist on the same side, so that one is confronted by the phenomenon of a heart being attracted towards pleural effusion rather than being repelled by it.

An x-ray picture shows even opacity, elevation of the diaphragm on the affected side and narrowing of the intercostal spaces.

Treatment varies. In the presence of underlying disease one naturally treats the underlying disease. If the patient suffers from syphilitic stenosis, antisyphilitic treatment is in order; if atelectasis is due to pressure from an empyema, drainage of the empyema will relieve the pressure. In some instances it is necessary to employ a bronchoscope to fulgurate a tumor or to remove a foreign body or a plug. Ordinarily, however, in cases of simple plugging by mucus one may obtain relief by shaking the patient or by frequently changing his position.

It is so difficult to remember all of the points which are made in any medical paper that I am going to ask you to take away merely one. It is this. After an operation, if your patient has an intrathoracic storm which resembles embolism, pleural effusion or pneumonia consider the possibility of atelectasis and have an x-ray taken to see whether or not the heart is displaced towards the affected side.

*Read at the Annual Meeting of the New England Surgical Society at Boston, September 26, 1930.

†Metcalf—Visiting Surgeon, Margaret Pillsbury General Hospital, Concord, N. H. For record and address of author see "This Week's Issue", page 176.

Discussion

Dr. Donald King: The surgeons at the Massachusetts General Hospital have very kindly allowed me as a medical man to listen to the chests of their patients after operations, because they were getting what seemed to be a great number of pulmonary complications and they wanted to know how many there were and what they could do about it. So I will just give you very quickly the figures of my investigation at the Hospital for the last ten months.

I might say, in the first place, that a complication of atelectasis is a very common one if you look for it, and whether you call it bronchial pneumonia in some cases, or whether you call it atelectasis, I think is absolutely impossible to say.

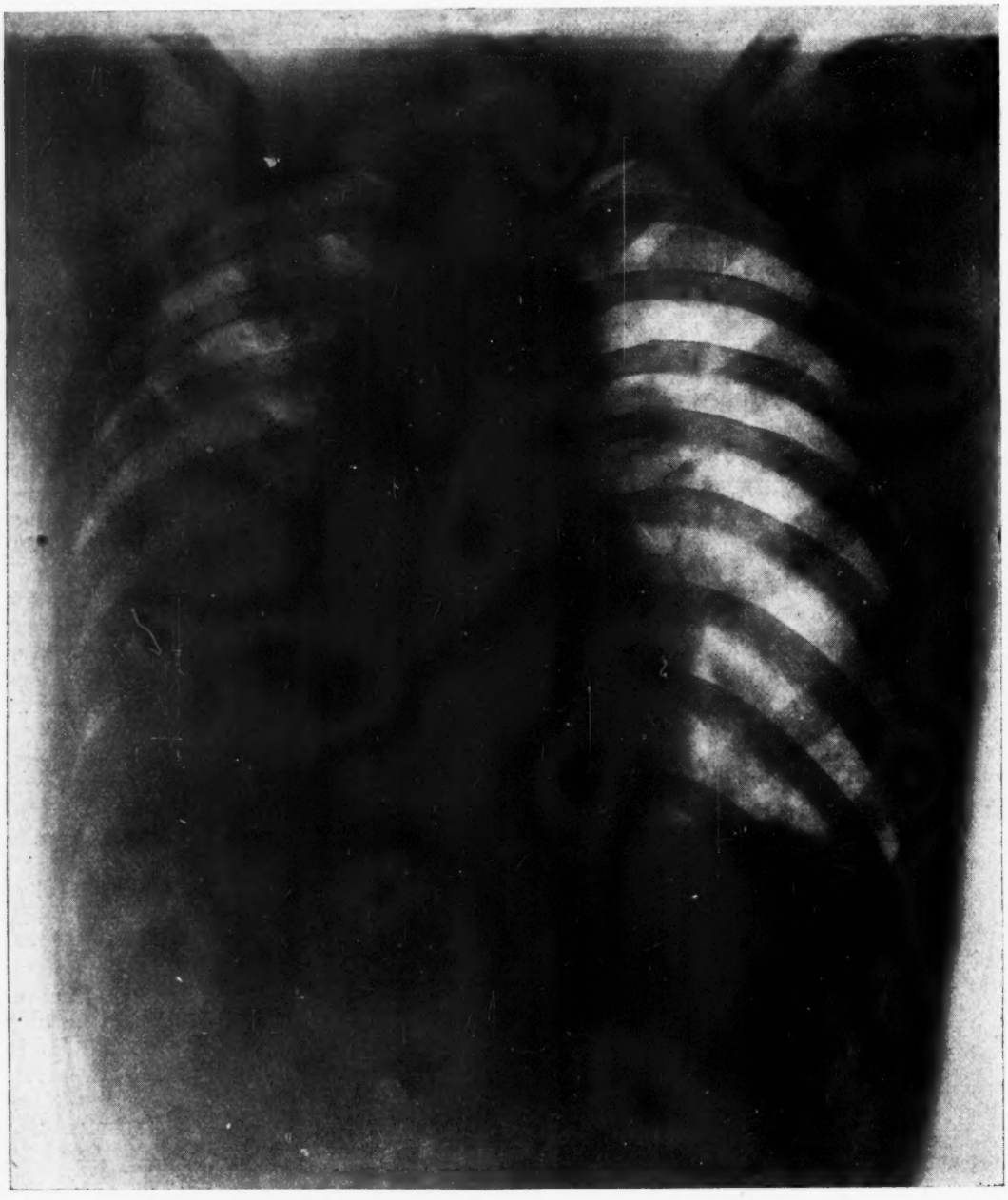

*FIG. 1. An x-ray taken at 10 A. M. on November 28, twenty-four hours after an operation for acute appendicitis. Collapse of the lower half of the right lung with some displacement of the heart towards the right side.

Here is a case. This is a patient now at the Massachusetts General, who was operated on for acute appendicitis. The appendix was drained. He had no cough; he had no sputum. He never had a temperature above 100.4° or a pulse above 100. But the man down there looking for chest complications found this. He certainly has a displacement with definite involvement of the right base. It is not a massive collapse but that

*The illustrations on pages 144, 145 and 146 were presented with Dr. Metcalf's paper.

is the sort of thing you will find all the time if you look for it.

	Total Collapse	Clinical Massive	X-ray, etc.
1928	16	8	8
1929	24	4	20
January-July, 1930	31	12	19
	71	24	47
Pneumonia	218		
	289		

(Slide) I have called these collapses instead of atelectasis because the name is shorter for the slide. In 1928, they have a record of 16 collapses, 8 of which could be diagnosed clinically and 8 of which required x-rays to make the diagnosis. In 1929, according to the surgical complication report, there were 24 collapses, 4 of which could be diagnosed clinically and 20 of which required x-rays to make the diagnosis. The cases I have followed since the first of January show 31 collapses, which shows that you

FIG. 2. Same patient. An x-ray taken the same day at 5 P. M. Upper portion of collapsed area reëxpanded and heart slightly less displaced. Narrowing of intercostal spaces on right.

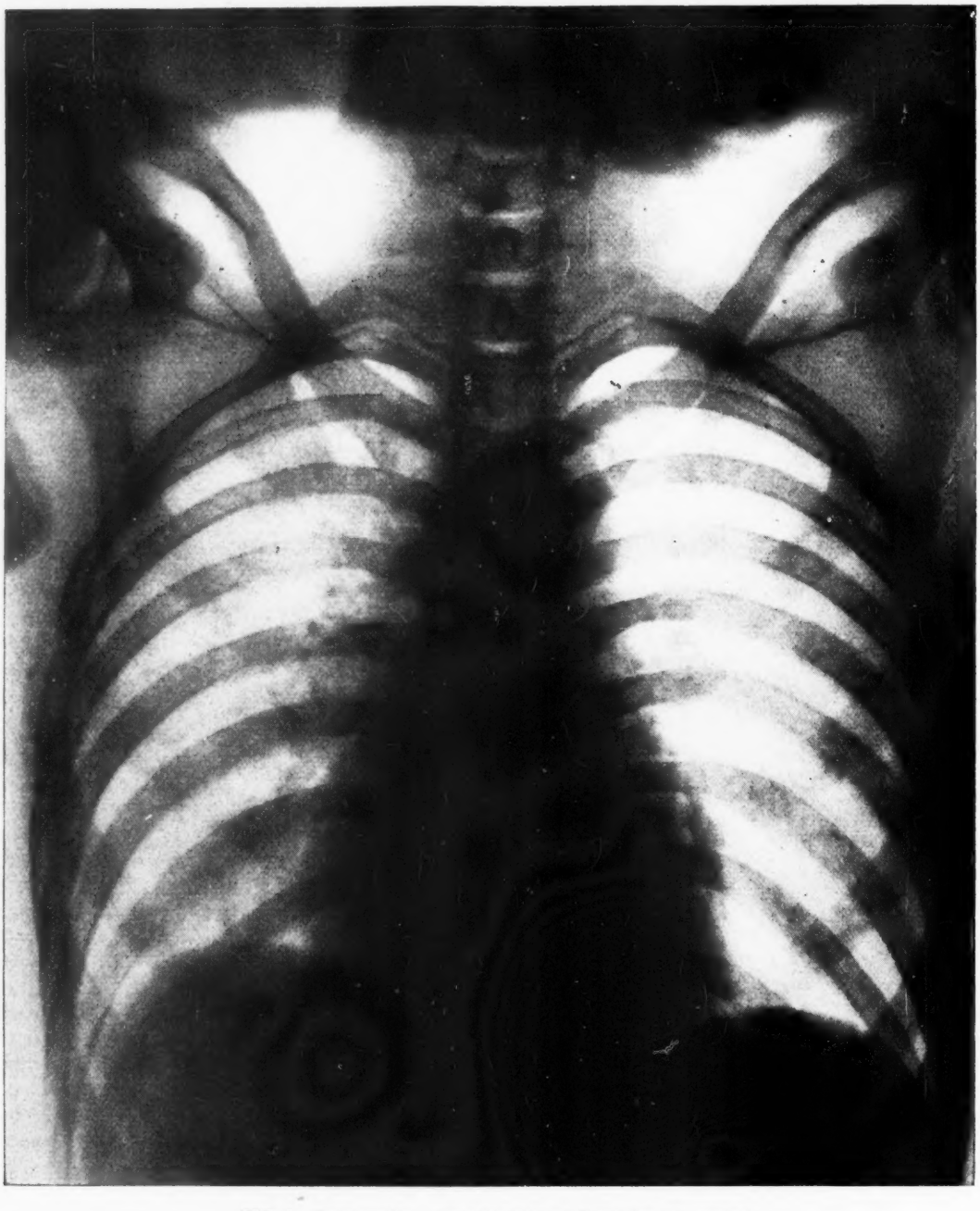

FIG. 3. Same patient. On afternoon of November 29 coughed up a considerable amount of tenacious sputum. This x-ray, taken November 30, shows nearly normal condition. Heart still slightly displaced to right and diaphragm still high.

can find many cases if you look for them. Twelve cases we got clinically without any question, and 19 took x-rays to find.

Beside those so-called collapse cases there were 218 bronchial pneumonias, so-called, where the x-rays showed no displacement, in the period from 1928 to July 1930, giving us a pretty heavy total of pulmonary complications.

SEX

1929 and January-July, 1930

	Collapse	Pneumonia	Total
Male	38	112	150
Female	17	38	55

(Slide) This is simply interesting because it shows the great predominance of males. This finding is carried out in almost any set of figures you look up, but it is much more so in the so-called pneumonia, than in the collapses. This shows 38 females to 112 males in the so-called bronchial pneumonia group.

ANESTHESIA

1929 and January-July, 1930

	Collapse	Pneumonia
Inhalation	41	94
Spinal	12	42
Local	2	14
	55	150

(Slide) The use of spinal anesthesia complicates the problem of the cause of pulmonary complications, because for a while everybody felt that spinal anesthesia was going to eliminate the complications. Forty-two of 150 pneumonias had had spinal anesthesia. That includes the bronchial pneumonias and not the so-called collapses.

1929 AND JANUARY-JULY, 1930

	Collapse		Total Ops.	Pneumonia	
	No.	Per Cent.		No.	Per Cent.
Upper abd. without g. b.	6	3.1	190	28	14.7
G. B.	4	1.9	210	14	6.6
Low. abd. without gyn.	27	2.4	1121	75	6.6
Gyn. lap.	3	0.6	457	6	1.3
Hernia	8	2.1	382	14	3.6
All others	7	0.2	3436	13	0.3
Totals	55	0.9	5796	150	2.5

(Slide) This is simply a chart showing the type of operation. The first group, the upper abdominal without gall bladders where we got a percentage of collapse of 3.1 out of 190 operations and a very much higher percentage of pneumonias, 14.7. That figure is about the same in other clinics. The gall bladder operation itself has a low incidence in collapse, higher in pneumonia. The lower abdominals without gynecological operation are pretty high. With gynecological operation they run low. Hernia runs pretty high. All other operations run distinctly low.

We have many figures but I think those are the ones that are perhaps the most interesting at this time.

DR. FREDERICK B. SWEET, Springfield: Dr. Metcalf suggests that the intensive study of pulmonary collapse tends to show that a very large percentage of all postoperative pulmonary complications are due to mucus obstruction, other obstructing agents such as foreign bodies, blood clots, etc., being of infrequent cause.

I have been very much interested in the work recently done by Dr. Coryllos of Cornell Medical College. He seems to have pretty definitely proven that the offending plug is usually mucous in character and that the resultant pathology very largely depends on the bacterial content of that mucus. If pneumococci predominate the resultant process is more or less characteristic of pneumonia, broncho or lobar. If pyogenic organisms, abscess or gangrene.

The causes of mucus obstruction, as we understand them, are largely due to shallow breathing, in turn the result of the patient's debilitated condition because of his disease, or the splinting of the abdomen following abdominal operations with its consequent influence upon respiration.

The extent of the pathological process depends largely upon the location of the obstruction. If a large bronchus be obstructed the following process is of course massive in character. If smaller branches of the bronchial tree be involved the process is correspondingly circumscribed. The dislodgment of the obstruction, whether by coughing, change of position or manual removal through the bronchoscope, usually speedily brings relief. This doubtless accounts for the well-known fact that most so-called postoperative lung conditions are of short duration.

DR. W. WHITTEMORE, Boston: I think Dr. Van Allen, of New Haven, has within the last year or so brought out some very interesting facts, scientifically, in his experiments on animals. We used to think that if any bronchus was plugged a definite atelectasis was produced. On the other hand, if you have a small bronchus coming off the main bronchus and this is plugged, an atelectasis may not be produced. Van Allen has shown that air may pass through the parenchyma of the lung, so that an atelectasis is not produced when a small bronchus is plugged.

If in human life this turns out to be so, it is going to be a very important thing from the thoracic surgeon's point of view in locating a malignant tumor, for example, when considering the possibility of removing it.

We have recently had two cases, one of which at the present time is in the hospital, and we are working on this idea, to try and definitely locate the new growth. Just where it is, of course, is going to determine whether the patient is operated on or not and whether the whole lobe of the lung is taken out or not.

This work of Dr. Van Allen's is new and very important.

DR. A. M. ROWLEY, Hartford: I do not think this subject should be closed without speaking a word upon prophylaxis. The hyperventilation of the lung by giving carbon dioxide just before the patient leaves the table, I believe is a preventive in a great majority of cases. It is a procedure that we always carry out even in short operations as collapse can occur in the minor as well as the major procedure.

I am glad that the pathologists and the internists are agreeing that these cases are usually produced by a mucous plug. The atelectasis should be relieved as quickly as possible to prevent serious infiltration and the resulting pulmonary consolidation. Posture, carbon-dioxide inhalations and bronchial aspirations will aid in this.

PRESIDENT CHEEVER: I should like to ask whether you have any figures which show a very pronounced diminution in the collapse?

DR. ROWLEY: I have no figures.

DR. DONALD KING: It may be of interest to say that we have given carbon dioxide in the

General in the operating room on all the cases since the first of the year. It was not given routinely in the wards afterwards. And our incidence has gone up instead of down. The reported incidence has increased because we have been looking for it more carefully. But it hasn't apparently diminished the number of cases which we have had.

We also on one service tried hyperventilation three or four times a day for the first two or three postoperative days. I do not think that was done carefully enough so we could draw any conclusions from it. It seemed to make no difference and we have been a little bit discouraged about carbon dioxide. I don't think from our figures we can draw any conclusions yet except that just doing it in the operating room has not made very much difference.

I think carbon dioxide for treatment, where you know you have a plug, helps them to cough up the plug. I haven't been sure it helped to expand the lung very much. If you give a patient who has a definite mucus plug carbon dioxide, he will cough and raise very much better.

PRESIDENT CHEEVER: May I ask about your figures of the incidence of massive collapse following spinal anesthesia? How about the percentage of cases occurring after spinal anesthesia?

DR. KING: I am sorry I haven't those figures. We are still working on them in order to find out how many spinal anesthesias were given in 1929 and 1930.

DR. S. RUSHMORE, Boston: Possibly one reason why cases which have undergone gynecological operations show a smaller percentage of lung complications is due to the position of the patient in which there is less likelihood of there being a blocking of the bronchus during the operation. If the Trendelenburg position is used there is less likelihood of the mucus going down into the bronchus, as it tends to accumulate in the pharynx whence it can be more easily removed.

DR. C. R. METCALF: There are just two facts in closing. The first one is this: in prevention Dr. Lord suggests using as little morphine as possible, changing the position of the patient frequently and avoiding tight thoracic swathes.

Lee tried out partially artificial pneumothorax in two instances where the symptoms were very trying, and thought that it was of great benefit to the patient.

AN ARRAIGNMENT OF PHYSICIANS FOR ALLEGED CONSPIRACY

According to a report in the daily press Drs. A. E. LeMarbre, J. F. Collins and William J. Delaney of Marlborough, Mass., Dr. Edward J. Flaherty of Maynard, Mass., and Dr. I. V. Armstrong of Hudson, Mass., were arraigned in the Middlesex Superior Court January 14, 1931, on secret indictments alleging conspiracy to defraud insurance companies. The District Attorney explained that their actions were taken because of a "widespread insurance swindle based upon fake automobile claims against various insurance companies". The investigations leading up to these indictments have been under way since last summer.

Irregularities with respect to claims for damages arising from automobile accidents have been suspected for some time and effective action wherever fraud is found to have been perpetrated will be welcomed by law-abiding citizens. It is to be hoped that court action will tend to show that doctors have not been parties to fraudulent claims.

It is intimated that others will be caught in the dragnet process underway.

FELLOWSHIPS IN PSYCHIATRY

Fellowships of $2,000 to $2,500 are open to physicians with previous hospital training in psychiatry, who wish to prepare themselves for extramural psychiatric work in the fields of child guidance, delinquency, dependency, education, and industry, announces the *Mental Hygiene Bulletin*. The course of training offered covers approximately one year and includes assignments for three or four month periods to various hospitals and clinics for practical instruction. Further information may be obtained from the National Committee for Mental Hygiene, 370 Seventh Avenue, New York City.—*U. S. Children's Bureau, Washington, D. C.*

IGNORANCE OF THE SIMPLE RULES WITH RESPECT TO HEALTH

Even as late as entrance to college life girls are found to have very little knowledge of the essential rules of health, according to Drs. Frances Scott and Anna M. Richardson of Smith College and Dr. Anna M. Gove of the North Carolina State College for Women.

These educational deficiencies were shown by wrong ideas about exercise, food, ventilation, mental hygiene and preventable diseases. Of the freshmen in Smith College some 28 per cent. did not believe in vaccination against smallpox.

Conditions among the average adult males were found by Howard W. Green, sanitary engineer of the Cleveland Health Council, based on an analysis of the physical examinations of over 100,000 men. He lays especial emphasis on the insufficient drinking of water, carelessness about transmitting colds and indifference to diseased teeth. Perhaps the old saying that "men are only boys grown tall" has an application in health matters.

STILLBIRTHS AND NEONATAL DEATHS IN BOSTON, 1929*

BY HAROLD C. STUART, M.D.†

THE progress made during the past twenty-five years in the reduction of infant mortality is well known and is accepted as one of the great accomplishments of preventive medicine. A careful analysis of the component parts of our mortality records shows that this reduction represents more striking accomplishment in some periods of the first year than in others, and greater achievement in special groups of diseases. The most striking effect has been in the reduction of diseases of the gastro-intestinal tract. Very little progress has been made in the reduction of fetal mortality and only slightly better results have been obtained in the neonatal period.

The causes of death in both fetal and neonatal periods are found to be quite different from those operative in later infancy, and much more obscure as to origin and development. It may well be that these causes do not lend themselves to prevention as do the diseases of late infancy. It is recognized that the application of preventive measures looking to the protection of the infant is much more difficult during the intrauterine period than after birth. Where interests conflict, the mother's life and health must always be given first consideration. But it is, nevertheless, true that much less study has been directed towards the problems of the fetus and of the newborn infant than to the study of diseases of later infancy and childhood. The newborn infant falls between the attention of the obstetrician and that of the pediatrician, and is little understood by the general practitioner. Whether or not we share the optimism of such students as Williams[1] or Holland[2], who believe that 50 per cent. or more of these deaths are preventable, we may nevertheless agree that they deserve more thoughtful attention.

The Department of Child Hygiene of the Harvard School of Public Health made a questionnaire survey of the fetal and neonatal deaths occurring in Boston during the year 1929 as a preliminary step in planning further studies, and it is the results of this survey which are being reported.

In order to secure the coöperation necessary to make such a study successful the support of the Boston Health League, the professors of obstetrics and pediatrics at the three medical schools of Boston, and the Health Commissioner of the City was solicited and secured. The interested coöperation of Mr. Joseph W. Monahan, head of the Division of Vital Statistics of Boston Health Department, was in large measure responsible for making this survey possible.

The information presented was chiefly taken from hospital records and from questionnaires returned by physicians. The cases to be studied were divided into those of infants delivered at one of the larger lying-in hospitals of Boston, where permission was given us to inspect the records, and all others born in the City, whether in the home or in one of the other hospitals. In the first group the questionnaires were filled out by the authors, chiefly from the hospital records. In the second group the questionnaire was mailed to the physician signing the death certificate. Each questionnaire contained three pages of closely typed questions, so worded, however, that answers could, in most cases, be copied from private records in a very brief period of time. The first page dealt with past pregnancies, maternal physical examination, prenatal care, and course of pregnancy; the second page, with factors of possible importance in labor and delivery; and the third, with the newborn infant and the physician's conclusions as to possible causes of death. The difficulties encountered in securing complete returns were, apparently, not so much from lack of coöperation as from a natural dearth of information in connection with the questions asked. This was particularly true in regard to the newborn infant. Even in the hospital records it was frequently impossible to form any concept of the condition of the infant or the signs that it presented during the interval between birth and death. Most of the questions concerning the infant were answered in too small a series to warrant inclusion.

The deaths due to faulty embryonic development were frequently added by us to the group of congenital malformations, without sending out a questionnaire, the death certificate being our only source of information. About 250 deaths from obviously acquired causes were not investigated. Otherwise the group of cases chosen for study included all stillbirths and deaths during the first five months of postnatal life; there were about 750 of these, but returns from the questionnaire were received in only 550 cases.

No attempt was made to study maternal deaths, but Table I shows the association of infant deaths with maternal deaths.

It is necessary at this point to define our use of certain terms. *Miscarriage* and *abortion* are used synonymously and refer to loss of products of conception up to age of viability (twenty-fourth to twenty-eighth week); these were not

*From Department of Child Hygiene, Harvard School of Public Health and Department of Pediatrics, Harvard Medical School with assistance of Haig Hosepian, M.D.

Read at the American Medical Association Meeting in Detroit, June, 1930.

†Stuart—Assistant Professor of Child Hygiene, Harvard Medical School and School of Public Health. For record and address of author see "This Week's Issue", page 176.

considered in the study although many doubtless were reported as stillbirths and included as such. *Stillbirth* and *fetal death* are used synonymously, although we prefer the latter term; they refer to the period of viability in utero, that is, from the twenty-fourth or twenty-eighth week up to and including delivery. *Neonatal death* refers to one occurring after delivery but within the first two weeks of life. Infants born with the heart beating are considered live births. *Late infant death* refers to one occurring after the second week but within the first year after delivery. *Premature infant* could not be sharply delimited from *full term infant* on the basis of information available, the physician's statement often being the only evidence. Where indicated, duration of pregnancy of less than eight and a half months, or birth weight under five pounds, was accepted as evidence of prematurity.

TABLE I

MATERNAL DEATHS BY CAUSES

Cause	Total	Associated with Infant Death
General Septicemia	14	3
Peritonitis	10	2
Paralytic Ileus	2	1
Gangrenous Cystitis	1	0
Pyelitis	1	0
Ectopic Pregnancy	2	1
Pneumonia	8	2
Pneumococcus Meningitis	1	0
Embolism	14	2
Puerperal Eclampsia and Toxemia	4	3
Placenta Praevia or Premature Separation	9	2
Cardiac Failure	5	2

Table II presents certain general figures relating to the case material composing the study. The interesting points brought out in it are:

1. There is a higher incidence of association with antenatal than natal factors.
2. The percentage of the deaths which occurred in the group delivered in hospitals (65.3 per cent.)* was lower than that of total births actually occurring in hospitals (70 per cent. in Boston in 1929).
3. The percentage of autopsies performed is low.
4. There seems to be nothing significant in the distribution between primiparae and multiparae as to number of deaths, although one of the tables will show the high incidence of deliveries by forceps in the former. The large number of deaths occurring in the high paras is of interest.

The data on prenatal care were most difficult to tabulate. The figures in Table III, however, are significant in indicating a higher occurrence of fetal and neonatal deaths among pregnant women having had inadequate prenatal care, or none, than among the entire pregnant population, for Boston has a well developed prenatal service, which is very extensively utilized.

For purposes of presentation the deaths have been divided in two dimensions: by probable cause and by period in which death occurred. The probable causes have been separated into those associated with antenatal maternal conditions, those associated with antenatal infant condition or of unknown conditions, and those associated with labor and delivery. Probably the true incidence of prematurity is not given among the fetal deaths because, when not mentioned and when no indication of prematurity was present, the case was listed in the full-term column.

TABLE II

GENERAL CONSIDERATIONS

			Per cent.
Total deaths considered		650	
Fetal		264	
Indicated premature	32		
Indicated macerated	77		
Neonatal		312	
Indicated premature	178		
Late infant		74	
Probably due to antenatal cause		438	
Probably due to natal cause		212	
Questionnaire answers obtained		550	
Place of delivery:			
Hospital		359	65.3
Home		167	30.5
Ambulance		3	0.5
No record		21	3.8
Autopsies reported		55	10.
Order of pregnancy:			
No record		55	
Primiparae		166	
Multiparae		329	
Number 2nd to fifth inc.	242		
Number 6th to ninth inc.	70		
Number 10th to 16th	17		

Of maternal antenatal factors associated with infant deaths (Table IV) the toxemia group is seen to be the most important. Toxemia causes death before delivery more often than after and is commonly associated with prematurity. Infant deaths associated with toxemia are apparently not chiefly due to prematurity from enforced early induction or to injury due to the same cause, for of fifty-eight such deaths labor was induced in only nine. Placental and uterine conditions come next in importance among maternal antenatal factors; they are associated mainly with prematurity but commonly cause fetal death. Syphilis is obviously incompletely reported, for in seventy-seven of the fetal deaths the fetus was delivered in a macerated condition. Both syphilis and accidents are fatal chiefly in the fetal period. Almost all deaths associated

*This figure represents the percentage of hospital deliveries in our questionnaire series. For the entire city of Boston 53% of the stillbirths and 63% of the neonatal deaths (first two weeks), or 58% of the combined stillbirths and neonatal deaths were delivered in hospitals.

TABLE III

Prenatal Care

			Number	Per cent.
Received Some Care:				
*Excellent			18	3.2
*Fair			55	10.
*Grossly inadequate			276	50.5
Received No Care			134	24.3
Not Specified			63	12.
Pelvimetry:				
Recorded taken			213	
Hospital cases	194			54% of hospital cases
Home cases	19			11.4 of home cases
Reported taken—adequate, or not specified	201			
Reported inadequate	12			5.6 of those taken
No report	337			61.3
Wassermann Reactions:				
Reported taken			191	
Positive	22			11.5 of those taken
Negative	169			
Not taken			304	
Not specified			55	
History of Previous Labors:				
Total previous difficulty reported			41	
Previous stillbirths		9		
Previous neonatal deaths		6		
Number of these having prenatal care this pregnancy		6		
Reported previous premature infants			68	

*_Excellent_ roughly corresponds to Children's Bureau standards.
Fair approached these but was inadequate in some particulars.
Grossly inadequate indicates less than three visits during entire pregnancy, and few, if any, routine procedures carried out.

TABLE IV

Deaths Associated With Antenatal Conditions

Apparent Cause	Fetal		Neonatal		Late Infant		Totals
	*F.T.	P.	F.T.	P.	F.T.	P.	
Pernicious vomiting		1		4			5
Toxemia, eclampsia and acute nephritis	13	12	5	13			43
Chronic nephritis	1	2	1				4
Pyelitis, and pyelonephritis		1		4		1	6
Congenital syphilis	3	5				1	9
Heart disease and anemia		1		2			3
Tuberculosis	1	1		1			3
Pneumonia and other respiratory disease	1			11			12
Hydramnios	2	1		1			4
Placental infarcts, threatened abortion, fibroids and endometritis	8	8	1	8		2	27
Operations				4		3	7
Accidents	4	8		1			13
? Criminal abortions		1	1	1			3
Totals	33	41	8	50		7	139

*F.T.—Full Term; P.—Premature.

TABLE V

Deaths Associated With Infant Disease or Unknown Cause

Infant Condition	Fetal		Neonatal		Late Infant		Totals
	F.T.	P.	F.T.	P.	F.T.	P.	
Malformations—Incidence	27		58		37		122
(Congenital defects) Probable cause of death							99
Atelectasis not associated with other cause			5	8		1	14
Hemorrhagic disease			8	1	1	1	11
Other disease specified			6	1			7
Only terminal cause given				1		8	9
Twins, triplets only condition	5	3	1	15			24
Others with no apparent cause	42	31	5	50		7	135

with maternal pneumonia occurred in the neonatal period, and were also associated with prematurity.

Table V emphasizes the importance of congenital defects, but also shows in what a large number of cases no cause of death could be assigned. It is probable that some of the cases listed here belong to the maternal group, but we have not enough information to warrant placing them there.

In listing the deaths apparently associated with labor and delivery (Table VI), interpretation is often complicated by the occurrence of several factors in the same child. Such cases have been listed under two or more headings, as, for example, prolonged labor and forceps delivery. When more than one factor was present, it is impossible to say which was the cause of death, although we may at times distinguish between direct and contributing factors.

Table VII would seem to indicate that some patients, allowed to remain too long unassisted in labor, did not progress satisfactorily, but we hesitate to pass judgment upon such obstetrical problems. The high proportion of natural breeches is also brought out rather strikingly. This study does not indicate that Cesarean section is the cause of a high incidence of neonatal death in Boston.

The available data concerning forceps deliveries (Table VIII) would seem to indicate that high forceps is a highly dangerous procedure for the infant, although we have no figures to indicate how many times high forceps delivery was resorted to among the total births during the year. The indications observed for the use of forceps, however, seem reasonable. The difference in proportion of cases requiring forceps between primiparae and multiparae is striking; previous difficulty had been reported in more than one-third of the multiparous cases requiring use of forceps.

At this point a table obviously should be shown giving the answers to questions regarding the condition and care of the newborn, but information is inadequate for preparation of such a chart. Not only is evidence of good care lacking, but there is considerable indirect evidence that many infants failed to receive reasonably adequate attention from the physician in charge. Apparently many were never examined. Normal routine was ordered for some whose condition obviously required special care. Some infants were sent to the breast to nurse when the condition had been recorded as too poor to permit of physical examination. Hospital records of newborn premature, debilitated or traumatized infants often consist almost entirely of nurses' notes, and are far less adequate than records of other patients in similar institutions.

Table IX compares some of our findings in Boston with those published in other series. It is most difficult, however, to make such comparisons on account of different systems of classifica-

TABLE VI

DEATHS ASSOCIATED WITH LABOR AND DELIVERY

Cause Two or More Causes for Same Case Given Where Both Likely Factors, Macerated Infs. Not Inc.	Foetal F.T.	Foetal P.	Neonatal F.T.	Neonatal P.	Late Inf. F.T.	Late Inf. P.	Totals 212 Cases
Prolapse or Constriction of Cord	19	3	6	3			31
Placenta Previa or Premature Sep.	7	15	1	28	1		52
Premature Rupture of Membranes	6	3		5			14
Natural Breech	9	4	11	15		1	40
Other Abnormal Presentations	9	1	5	4		1	20
Prolonged Labor	20	1	5	5			31
Forceps	38	1	28	7			74
Version	17	1	3	4			25
Craniotomy							6
Therapeutic Inductions	3	3		15			21
Cesarean			4	8		1	13
Totals	128	32	63	94	1	3	327
Resulting Intracranial Inj.	5	1	27	7	1		41
Resulting Asphyxia	10	2	4	2			18

TABLE VII

LABOR AND DELIVERY

	No.	%
Labor (Inadequately Reported):		
Total length over 48 hrs.	29	
Second stage over 2 hrs.	59	
Second stage over 6 hrs.	5	
Induced	25	
Presentation and Delivery:		
Not Specified	62	11.3
Vertex	345	63.2
Natural Breech	103	18.2
Versions	39	7.1
Transverse	12	2.1
Craniotomies	6	1.1
Cesareans	21	3.8
For:		
Eclampsia 3		
Placenta Previa 3		
Prem. Separation 7		
Ineffectual Labor 4		
Chronic Cardiac 1		
Previous Caesareans 3		

tion. The low occurrence of syphilis and the high incidence of malformations are the notable features of our figures. We believe that in both of these our figures are in error, the former for reasons stated above and the latter, because of attributing death to a defect which was not the chief factor. There is nothing in our data to indicate that conditions in Boston are fundamentally different from those in other comparable communities of the United States. We believe that the findings are a rough expression of the present situation generally.

TABLE VIII

FORCEPS CASES

		No.	%
Reported Used		129	23.6
High	42		
Medium	13		
Low	27		
Not Specified	45		
No Record		61	11.2
Not Used		356	65.2
Total		546	65.2
Indications for Use:			
Placenta Praevia	6		
Premature Separation	11		
Prolapsed Cord	7		
Toxemia	8		
Long, Sluggish Labor, or Difficult Progress	39		
Abnormal Presentation	26		
No Reason Given	32		
Total		229	
Used in Primiparae	84	(50% of Primip.)	
Used in Multiparae	45	(13.6% of Multip.)	
Previous Difficult Labor Reported in Forceps Cases	17	37.7%	

TABLE IX

COMPARISON OF FIGURES OBTAINED IN BOSTON STUDY 1929 WITH PUBLISHED AUTOPSY STUDIES FOR CHIEF CAUSES

	% OF TOTAL			
Cause	Boston 1929 650 F. + Neo.	Holland 1922 300 F.	McQuarrie[3] 1919 119 F.	Adair[4] 1925 450 F. + Neo.
Syphilis	2.	14.	15.5	3.5
Toxemia + Eclampsia	10.	7.6	9.	4.
Cong. Malfor.	18.7	4.4	8.2	10.4
Placenta Previa + Prem. Separation	8.	22.	6.7	2.2
Prolapse or Constriction of Cord	14.6	4.	7.7	?
Birth Trauma	32.9	23. ?	29.4	28.8
Prem. *s* Other Cause	7	?	5.3	?

Note: No two classifications identical. Some error probable in above distributions. Boston study gives occurrences, others only primary causes.

This paper can be only a report of observations and space does not permit of analysis of the figures presented from the standpoint of the possibilities of prevention. The opportunity for reducing both maternal and infant mortality through adequate antenatal and intranatal care has been considered by many writers and has of late been given much publicity. Wickremesinghe[5], in our department, recently studied the incidence of prematurity in 24,000 births in the City of Boston and grouped them according to the amount of prenatal care the mother had received. Among those who had received no prenatal care, or care for less than three months, the incidence was forty per thousand, whereas among those who had received this care for three months or more, the incidence was eighteen per thousand. Thus the commonest factor associated with fetal or neonatal death occurred less than half as frequently among women having had three months or more of prenatal care, not taking into account the adequacy of this care.

The preventive possibilities of good postnatal infant care have, in the past, received inadequate consideration. Schlutz reviewed these possibilities very briefly at the 1929 annual meeting of the American Child Health Association. We would concur in his opinion that skillful and attentive discharge of the important functions of the responsible physician is more needed than expensive equipment.

CONCLUSIONS

Good care during labor alone cannot influence the fetal and neonatal death rates in more than one-third of the cases. The other two-thirds must be influenced, if at all, in the prenatal period. For its maximal effects, however, prenatal care requires to be followed by intelligent natal care, based upon the indications obtained in the prenatal period. On the basis of any standards one might choose, good prenatal care had rarely been given during the pregnancies that terminated in fetal or neonatal death; this is in marked contrast to the general application of prenatal care in Boston.

Adequate advantage had not been taken of pelvic measurements, Wassermann test, and other criteria of known assistance. The results of this inadequate prenatal care were clearly reflected in the incidence of certain causes of death.

The fetal and neonatal mortality was no higher in hospital deliveries than in home deliveries, in marked contrast to maternal mortality, and in spite of the probable higher incidence of difficult cases.

The toxemias of pregnancy were the most common maternal condition associated with these infant deaths, apparently causing injury to the fetus in utero.

There was very little indication that labor had been induced unnecessarily or that Cesarean sec-

tion had been resorted to without justification. The use of forceps in the series was frequent, but there was also a high incidence of prolonged labor, and we are not sufficiently experienced, nor is enough information available, to judge whether forceps should have been used more or less frequently.

Hemorrhage from placental conditions (praevia and premature separation) was the most common cause given for difficult labor and delivery.

Breech presentation was, apparently, the most important mechanical factor.

In 25 per cent. of the cases it was not possible to assign a reasonable cause for death.

The available information points to the importance of taking an early interest in the needs of the new-born and in securing for the new-born the best possible early care.

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SALYRGAN AS A DIURETIC. REPORT OF SIXTY CASES*

BY HOWARD B. SPRAGUE, M.D.,† AND ASHTON GRAYBIEL, M.D.†

FOR many years mercury given by mouth, usually in the form of calomel, has been administered as a diuretic in cardiac edema. It is said to have been in common use for this purpose in the latter part of the eighteenth century. It then fell into disuse and was rediscovered by Jendrassik in 1886-1891. In recent years the more complex organic mercurial salts have been used by parenteral injection for the treatment of syphilis, beginning with the introduction of novasurol (merbaphen) in 1917. Saxl[1], in 1920, discovered that in the treatment of patients with luetic aortic regurgitation and edema by means of novasurol there was a decrease in the edema. Acting on this observation, he found that mercury in this form was equally effective in treating the edema of non-syphilitic cardiac patients[2]. Salyrgan, a related mercurial salt, likewise has this beneficial effect and appears to be less toxic than novasurol. It is now used as a diuretic rather than an antisyphilitic drug.

Salyrgan-(mersalyl) — {sodium (o-[hydroxymercuric-methoxy-propylcarbamyl] phenoxy} acetate—has been used in the treatment of edema at the Massachusetts General Hospital for three years (March, 1930), at present largely to the exclusion of other mercurial diuretics. Because the great value of this drug has not been sufficiently appreciated by the medical profession at large, we are herewith reporting a series of sixty cases treated for edema‡. All, except seven who were at the House of the Good Samaritan (Boston), were patients in the Massachusetts General Hospital.

*From the Cardiac Clinic, Massachusetts General Hospital, Boston.

‡Since the collection of this series of cases we have used the drug freely and our experience confirms the conclusions of this paper. (January, 1931.)

†Sprague—Assistant Physician, Massachusetts General Hospital. Graybiel—Medical Interne, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue", page 176.

CONDITIONS TREATED

The majority of patients in this group given salyrgan were suffering from congestive heart failure. Twenty-four had rheumatic heart disease, twelve hypertensive heart disease, six arteriosclerotic heart disease, three syphilitic heart disease and one chronic adhesive pericarditis. Eight others had cirrhosis of the liver; four, cancer; one, nephrosis; and one, an ovarian cyst. In thirty-seven cases ascites was noted. In the cardiac cases there was a control period during which the effect of rest, digitalization, limited fluid intake, and, in many instances, other diuretics, was tried. This helped to determine the value of subsequent salyrgan. In the beginning, the drug was often used as a diuretic of last resort, but appreciation of its activity and relative lack of toxicity has led us, during the past year, to use it earlier in the treatment.

TECHNIQUE OF ADMINISTRATION

Salyrgan is marketed in ampoules of 1 cc. of a 10% aqueous solution containing 37 mg. of mercury. This dose contains 3 mg. more mercury than an equal amount of merbaphen (novasurol). Our patients were given ½ cc. of the drug intravenously, rarely intramuscularly, as a test dose, and if, by the following day, no toxic effects were noted such as the occurrence of albumen, casts or blood in previously clear urine, or skin or mucous membrane irritation, 1 (or 2) cc. was given intravenously. This injection is best made with a hypodermic needle, great care being taken in administering the injection. Some have found that dilution with normal salt solution to 5 cc. will prevent any pain and decrease the danger of irritation of the wall of the vein and thrombosis. The salyrgan has also been given with larger amounts of intravenous glucose, but not in the series

here reported. The dose of one or two cc. can be repeated every three days for as long as necessary unless toxic symptoms occur. One patient in our series received 34 injections of the drug in about six months. There is some question as to whether larger doses—up to 4 cc.—may be effective in stubborn cases. Barker and O'Hare[3] have reported, however, that too frequent injections are relatively ineffective. Agnew[4], on the other hand, has reported a favorable result in a patient with portal cirrhosis, who received 2 cc. of the drug every other day for nine months.

As in the case of merbaphen the use of acid salts, such as ammonium chloride or nitrate, in doses of 5-10 grams daily will, in many cases, increase the diuretic effect, but in our experience the satisfactory response to salyrgan alone has made us try it routinely without the addition of these salts, which are apt to cause gastric disturbance. They can be given with a subsequent trial either in salol coated tablets, as Barker and O'Hare suggest, or in some vehicle like peppermint water, which Keith[5] has favored.

RESULTS OF SALYRGAN THERAPY

The results of treatment with salyrgan in this series of sixty cases are shown briefly in the table. Fifty cases had a diuretic response in which the urinary output exceeded the fluid intake: in fifteen it was over three times the intake, in nineteen it was between two and three times the intake, and in sixteen it was less than twice the intake. The response was usually prompt and the effect was secured during the 24 hours following the injection. In one-third of our cases, the diuresis persisted with gradual diminution for two to five days.

Conditions Treated	No. of Cases	Diuresis				
		o	±	+	++	+++
1. Rheumatic heart disease alone	11			4	4	3
2. " " " with pericarditis	5	1		2	1	1
3. " " " " " and hypertension	1					1
4. Rheumatic heart disease and pancarditis	1			1		
5. " " " , hypertensive and arteriosclerotic heart disease	1	1				
6. Rheumatic heart disease and arteriosclerotic heart disease	1					1
7. Rheumatic heart disease, hypertensive and arteriosclerotic heart disease and chronic nephritis	1			1		
8. Rheumatic heart disease, luetic heart disease and subacute bacterial endocarditis	1				1	
9. Rheumatic heart disease and subacute bacterial endocarditis	1			1		
10. Rheumatic heart disease (and carcinoma)	1			1		
11. Chronic adhesive pericarditis	1				1	
12. Luetic heart disease	2	1		1		
13. Luetic heart disease and chronic nephritis	1	1				
14. Hypertensive heart disease	3			1	1	1
15. Hypertensive heart disease and chronic nephritis	4		1	2	1	
16. Hypertensive and arteriosclerotic heart disease	4		1		1	2
17. Hypertensive and congenital heart disease	1					1
18. Arteriosclerotic heart disease	5		1		3	1
19. Arteriosclerotic heart disease and chronic nephritis	1				1	
20. Cirrhosis of the liver	8	2		2	3	1
21. Nephrosis	1					1
22. Carcinoma of the vagina and polycythemia	1				1	
23. Carcinomatosis	1		1			
24. Carcinoma of the liver and chronic nephritis	1					1
25. Malignant ovarian cyst	1					1
26. Ovarian cyst and chronic nephritis	1				1	
	60	6	4	16	19	15

o = no diuresis
± = output less than intake
\+ = output more than intake but less than twice the intake
++ = output between two and three times the intake
+++ = output over three times the intake

Age and Sex: We have found the drug equally effective in both sexes and at all ages from 5 to 83 years.

Blood Pressure: Thirty-seven cases had a systolic blood pressure less than 140 mm. and a diastolic pressure under 90 mm., except in a few instances when the diastolic pressure was slightly above 90 mm. Twenty-three cases had a systolic blood pressure over 140 mm. and a diastolic pressure usually above 90 mm. Blood pressure was found unimportant in affecting the

diuresis from salyrgan. The lowest blood pressure was 90 mm. systolic and 40 mm. diastolic in a 15 year old boy with rheumatic heart disease and salyrgan produced a good diuresis even though previous digitalization was without effect. Salyrgan is particularly suitable for patients with hypertensive heart disease with normal cardiac rhythm, who often respond less well to digitalization than do those with auricular fibrillation.

Duration of the Disease: Duration of the disease and of the edema was not a factor conditioning the diuretic response to salyrgan. The edema or ascites of long standing yielded with the same readiness as that of recent origin.

Cardiac Enlargement: Nearly all of the patients in this series presented considerable cardiac enlargement. No relationship was demonstrated between the degree of enlargement or the differential right or left sided hypertrophy, and the diuretic effect of the drug.

Cardiac Rhythm:

Normal Rhythm—31 cases (2 patients had prolonged A-V conduction time). Four of the 31 patients responded poorly or not at all. In one instance of failure a single injection was given; one patient had cirrhosis of the liver and ascites; one patient had carcinomatosis and ascites and the fourth had luetic heart disease and chronic nephritis.

Auricular Fibrillation—15 cases. Four of the 15 patients responded poorly or not at all. One had arteriosclerotic heart disease. One had hypertensive heart disease and chronic nephritis. The other two patients received but a single injection of the drug.

Auricular Fibrillation and Intraventricular Block—2 cases. Diuresis was slight in one and moderate in one.

Intraventricular Block—7 cases. Two responded poorly; both received only a single injection.

Ventricular Premature Beats—4 cases. Diuresis was marked in one, moderate in two, and slight in one.

Sino-auricular Tachycardia—1 case. Slight diuresis occurred.

It is readily seen that in the instances of failure of the drug to act, other factors than cardiac rhythm are probably responsible for variations in diuresis.

Ascites:

Ascites was noted in 37 of the 60 cases. In 10 instances no follow-up notes were made and it was impossible to learn the result of salyrgan therapy on the effusion. In 15 instances the fluid was reduced by a satisfactory amount, in eight cases there was no reduction of the ascites, and in four a slight reduction. In general we have not experienced the remarkable results reported by some authors in the treatment of ascites with this drug.

Nephrosis:

A favorable result was secured in a patient with nephrosis with a total diuresis in excess of fluid intake attributable to the drug of 12,060 cc. over a period of two months. He received 9 doses intravenously, totalling 14 cc.; ammonium chloride was given with it (4 gm. daily or every other day) for the first five weeks.

Malignant Effusions:

There has been some mention in the literature relating to the effect of salyrgan upon malignant pleural and peritoneal effusions. Of the four cases of cancer in our series, in three there were liver metastases with portal obstruction. The diuresis from salyrgan satisfactorily reduced the ascites in two patients, but in one of these the marked effect was thought to have hastened death in a cachectic woman with carcinoma of the vagina. One patient only had generalized peritoneal carcinomatosis and effusion, due to a malignant ovarian cyst. No effect upon the effusion was secured by salyrgan. It is suggested by our experience that the drug should be useful in malignant disease with ascites from portal obstruction in decreasing the number of abdominal paracenteses necessary for relief.

Unsatisfactory Results:

Our records show that in 10 of the 60 cases salyrgan either failed as a diuretic or the resulting diuresis was small and did not equal the intake. Five of these patients had only a single injection of the drug. As the first injection often does not produce a diuresis when subsequent injections are effective, it cannot be said that the effect of salyrgan was completely tested, particularly as seven of these patients received no ammonium salt.

Best Results:

The fifteen patients in whom the diuresis was over three times the fluid intake ranged in age from 17 years to 63 years. Six had rheumatic heart disease, five arteriosclerosis (with or without hypertension), and one each nephrosis, malignant disease with portal obstruction, cirrhosis of the liver, and ovarian cyst. The fluid of the cyst was not affected by the diuresis. One cardiac patient lost 47 pounds in four days following one injection of salyrgan after digitalis and theocin had proved ineffective.

Terminal Cases:

Twenty patients in this series died in the hospital. This high mortality is due to the fact that in many salyrgan was given as a last resort. In ten a diuresis was not secured or was slight. In only three was there complete failure. In the other cases diuresis could, at least at first, be considered satisfactory. In one, a patient with carcinoma of the vagina and ascites, the profuse diuresis was considered to have hastened death.

Untoward Effects:

Undesirable effects were noted in seven cases, as follows:

1. Luetic cirrhosis of the liver. A shower of granular and cellular casts, and albumin appeared in the urine and salyrgan was omitted.

2. Rheumatic Heart Disease. The urine was loaded with red cells once but on later injections there was no evidence of toxicity.

3. Rheumatic Heart Disease. Red blood cells appeared in the urine after the second injection; after further injections there was no evidence of renal irritation.

4. Hypertensive Heart Disease. A shower of red and white blood cells, and albumin in the urine followed an injection, but on subsequent injection no evidence of renal toxicity appeared. However, the patient did have a chill following this injection and the drug was discontinued.

5. Hypertensive Heart Disease. One case of mild mercurial dermatitis followed prolonged use. The patient received 33 injections over a period of several months.

6. One case of cellulitis of the arm and phlebitis of the vein into which injection was made. The patient was critically ill with rheumatic heart disease and died five days later. Autopsy revealed a thrombosed left subclavian vein.

7. One patient developed diarrhea following the use of salyrgan, and presumably from the drug, as it cleared up on discontinuing the injections.

DISCUSSION

From our experience with salyrgan we confirm the opinion of other observers that the drug is an active and safe diuretic, of particular value in the treatment of congestive heart failure with edema, of ascites from various causes, and of nephrosis. In some cases it may be useful in treating malignant effusions. It should be used early in the therapy of these conditions and not reserved as a drug of last resort. As a diuretic for repeated use it is useful in its freedom from serious toxicity and almost complete absence of gastro-intestinal irritation. Its effectiveness can often be increased by combining it with acid salts, such as ammonium chloride or nitrate, or with other diuretics and digitalis.

There still remains some question as to the mode of action of salyrgan as regards its renal or extrarenal effects. The most important evidence that such drugs act by producing renal changes has recently been reported by Govaerts[6]. He perfused with blood from an intact animal, transplanted kidneys taken from dogs that had received novasurol and showed that the diuretic effect remains marked and characteristic in the treated kidneys when the kidneys of the animal are excreting normally. Govaerts showed also that when normal kidneys are perfused with the blood of dogs previously treated with novasurol, they will excrete normal amounts of urine when the dog's own kidneys in situ are producing a marked diuresis. This work and that of others studying the problem supports the view that the chief effect of mercurial diuretics is directly upon the kidney.

SUMMARY

1. Sixty cases treated with salyrgan are reported. Forty-six patients had cardiac disease with congestive failure; eight had cirrhosis of the liver; four had cancer; and one each nephrosis and ovarian cyst.

2. In spite of the fact that one-third of these patients were in the terminal stages of chronic disease, diuresis was secured by the use of salyrgan in 80%. This diuresis exceeded twice the fluid intake in 55% of the cases.

3. The diuretic effect may often be increased by the use of ammonium chloride or nitrate.

4. Toxic effects from salyrgan are very rare and consist of mild renal, gastro-intestinal or skin irritation. The only complication of importance in our series was in one patient who had cellulitis of the arm and thrombosis of the vein into which the drug was given. Careful technique should prevent this.

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A REVIEW OF CROSSED CIRCULATION EXPERIMENTS*

BY W. M. FIROR, M.D.†

SEVERAL methods for crossing the bloods of experimental animals have been described. In 1890 Fredericq[1] reported the results of his researches on dogs and rabbits, in which an intercarotid exchange was secured by inserting glass tubes between the severed ends of the vessels. By this method he was able to confirm the theory of Rosenthal that the composition of the cerebral circulation regulates respiration. Eleven years later Fredericq[2] improved the method by using rubber tubes with glass tips and by injecting peptone to retard clotting.

*From the Department of Surgery of the Johns Hopkins Medical School.

†Firor—Associate Surgeon, Johns Hopkins Hospital. For record and address of author see "This Week's Issue", page 176.

Hédon[3, 4], in 1910, carried out numerous experiments by using a metal tube, lined throughout with excised vein, to conduct the blood from one vessel to another. These Payr tubes permitted the crossing of the bloods for as long as nine hours. Hédon claimed that it is possible to stop temporarily the passage of blood through the tubes without danger of clotting. He does not report, however, having done so, and it seems doubtful whether such a result is possible of attainment without the use of an anticoagulant. To prove that the anastomoses functioned, this investigator injected fluorescin intravenously into one animal and detected it in the other. He observed that the pulse rates and temperatures of cross-circulating dogs are not always the same. He studied the variations in the blood pressures of both animals after nervous and chemical stimulation of one of them. Firor[16] has not been able to confirm the changes in blood pressure which Hédon obtained after occluding one carotid artery. Hédon records the occurrence of glycosuria in a normal dog the circulation of which was crossed for six hours with that of a depancreatized one. He dismisses the possibility of direct anastomosis of blood vessels by sutures as being "peu pratique". Fleig used one of Hédon's preparations to test the effect of the injection of hydrochloric acid into the duodenum upon the secretory activity of the pancreas.

In 1914 Crile[5, 6] stated that, following carotid-jugular anastomoses between dogs, one of which was later shocked, the brain of the second dog did not show the changes which he detected in that of the shocked animal. He records only one experiment, and if the drawings (p. 73, Anoci-Association) illustrating the procedure are correct, one animal should have bled to death into the other, within a few minutes. If the text is correct, it seems only natural that the brains would have been different, for one brain received only half as much blood as the other brain, and moreover, one brain was in danger of receiving minute emboli from the area of anastomosis, whereas the other was not. Crile fails to offer any proof that the circulations were crossing at the conclusion of the experiment. Furthermore, his work was not checked with a single control.

Similarly, Janeway and Ewing[7] mention, in the course of an article on the nature of shock, that they anastomosed the carotid arteries and jugular veins of two dogs and then handled the abdominal viscera of one of them. They report that the splanchnic area during manipulation drained off sufficient blood to exsanguinate the other dog. Details of the technic are not given, but it is highly probable that if they followed the carotid-carotid jugular-jugular anastomosis of Crile, the exsanguination occurred because the venous anastomosis did not remain patent. This is frequently the result in such anastomoses.

Bazett and Quinby[8] (1920) reported a method whereby all of the blood entering the ascending aorta of one dog could be exchanged for that of another, or returned to its original course. They accomplished this by using a fourway stopcock connected by thin rubber tubing with the glass cannulae in the vessels. The channels of the apparatus were coated with vaseline. With this apparatus these investigators studied the relative importance of chemical and nervous factors in the pressor response to stimulation and in the maintenance of vascular tone.

The method of Bazett and Quinby has the advantage of permitting the circulations to be repeatedly crossed or separated. The use of their apparatus necessitates the shutting off of the entire systemic circulation for a minute or longer, and its use also requires the maintenance of artificial respiration because of the accompanying pneumothorax. There is another condition apart from the pneumothorax which necessitates artificial respiration, and this is that all of the arterial blood supplying one dog's brain is aërated in the other dog's lung; consequently, hypernea in one animal causes apnea in the other.

Chabrol[9] in 1921 presented as his thesis for the degree of doctor of medicine at the University of Algiers a monograph entitled, "Des Mécanismes Nerveux Régulateurs de la Pression Artérielle." Included in this work is the description of several experiments in crossing the cephalic circulation of dogs. He modified slightly the method of Hédon. This study carefully records the effects upon the blood pressures of cross-circulating animals of stimulating the crural nerve and the vagus, of compressing the aorta, and of injecting serum into one of the pair. He claims that the general law governing the blood pressures of cross-circulating animals is that "toute hypertension chez l'un des animaux suscite une hypotension chez l'autre et inversement". As will be indicated below, this law is not a general one; it holds true only temporarily, for certain sudden changes.

Tournade, Chabrol, and Marchand[11] gave a brief review of this work in *Comptes rendus des séances de la Société de biologie* in 1921.

In 1923 McIver and Haggart[12] perfused the amputated lower half of one dog with the blood from another in an effort to substantiate the work of Cannon and Bayless on the relation of muscle injury to shock. They inserted paraffin-lined glass cannulae between the abdominal aortae and venae cavae. Such a method is not actually an experiment in cross circulation since there is no reciprocal exchange of blood between the two animals.

Anrep[13] described a method of maintaining the circulation in the lower half of a dog with defibrinated blood which passed through a denervated heart-lung preparation. The vascular communications between the upper and lower halves of the dog were completely interrupted,

whereas the nervous communications were intact. Thus the heart-lung preparation was subjected to physical and chemical stimuli brought to it by the blood from the lower half of the body. The upper part of the animal was subject to various kinds of stimuli arising within itself and also to nervous impulses from the lower half of its body, which, in turn, had a vascular supply from the heart-lung preparation and nervous communications with the upper half of the animal. This method has the limitations of any heart-lung preparation, but its advance over preceding ones lies in the fact that the vascular circuits are separate. As a consequence of this fact, changes in the blood and circulation of one part of the preparation do not directly affect the blood and circulation of the other part. Furthermore, the operator has control over the blood flow and blood pressure in one of the vascular circuits.

Anrep and Starling[14] studied the central and reflex regulation of the circulation by means of a similar technic, in which the heart-lung preparation was connected with the vessels of the head of the animal, instead of with those of the lower half of the body.

Somewhat similar, but less easily controlled, are the experiments of Heymans and Heymans[15]. These investigators divided all of the structures in a dog's neck except the vagi. The isolated head was perfused with the blood from the trunk of another dog, while the heart and lungs were perfused with the blood from the trunk of a third dog.

In all of the foregoing experiments the exchange of blood between the animals was a temporary condition. It is conceivable that Hédon's dogs might have continued to cross-circulate for long periods of time if aseptic technic had been followed and if the animals could have been kept together. Furthermore, in all of the methods for crossing the circulations of animals the anesthesia was continued throughout the duration of the experiment. In the technic of Bazett and Quinby, Anrep, and Heymans and Heymans the dogs had to be sacrificed.

In an effort to find out how long it is possible to maintain a free exchange of blood between dogs and to ascertain the effects of such a continuous crossed circulation in normal unanesthetized animals, Firor[16] devised the following method. End-to-end anastomoses were done with vascular sutures between the carotid artery of one dog and the external jugular vein of another, and vice versa. The tissues about the vessels of one dog were sutured to those of the other. Rigid aseptic technic was employed throughout the operation. The two animals were held together with adhesive bands. The interchange of blood was maintained in several pairs for three and four days and in two cases for a little over six days. During this time the animals seemed entirely normal except that their activities were limited. Several of the pairs, however, learned to walk about in unison. The common outcome was for the wounds to break down and the vessels to become thrombosed subsequently. In only four instances did one animal bleed to death into the other. In fifteen of the forty experiments the sera and cells of the intended mates were matched before operation. In only two instances was there agglutination and hemolysis. Nevertheless, one of these two pairs tolerated the exchange of blood for between four and five days.

Repeated daily observations were made upon cross-circulating pairs. It was found that the pulse rates, respiratory rates, and rectal temperatures are usually different in the two animals. The CO_2 tension of the alveolar air in the members of three pairs was determined and found to be distinctly different. The blood pressures also remain at different levels. Temporary variations of 10 to 15 mm. of mercury in the pressure of one dog do not cause any alteration in the pressure of the partner. Epinephrin or histamin injected into one animal causes similar and almost synchronous changes in the blood pressure of each. Nervous stimuli causing variations of 10 to 20 mm. of mercury in the pressure of one animal do not affect the pressure of the partner. When, however, nervous stimuli evoke the secretion of a chemical which affects blood pressure, the resultant changes occur in both animals. The blood chlorides, phosphates, and sugars of the members of a pair become and remain the same while the anastomoses continue to function. Spectroscopic examination of the blood plasma failed to show evidence of hemolysis. The fragility of the red blood cells of several pairs did not show alterations when the bloods were mixing. The detection of a bruit over the anastomosed vessels affords an easy means of showing that the bloods are crossing.

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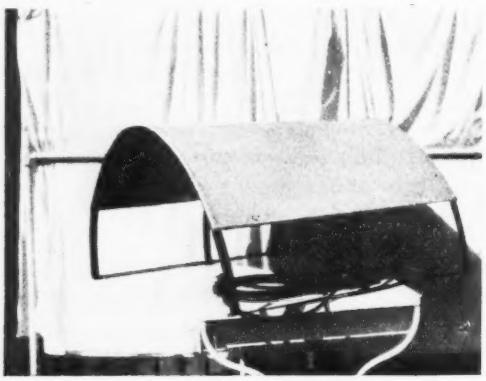
A NEW TYPE OF HEATED CRADLE*

BY HENRY H. FAXON, M.D.†

EARLY in the work of the Peripheral Circulatory Clinic at the Massachusetts General Hospital it was found that the supply of heated cradles inadequately filled the demand, and that furthermore those available had the following disadvantages: 1. They were too small. 2. They were too unstable and easily broken. 3. There was no satisfactory way of controlling the amount and distribution of the heat. 4. There was not the margin of safety from a fire hazard point of view that was desirable. In an attempt to obviate these objections the type of cradle illustrated below was evolved.

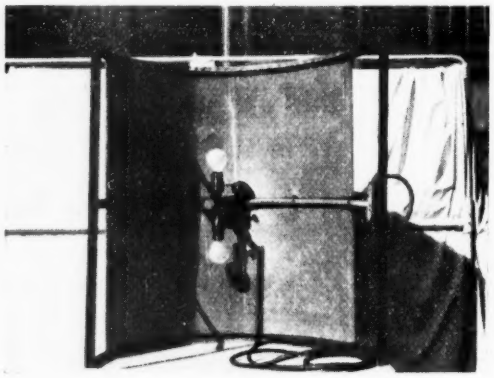
The frame is made of three-quarter inch by one-eighth inch rounded iron strips, riveted together. The reinforcing horizontal pieces are nine inches up from the base, and the curved cross strips, fifty and one-half inches long, which gives a sixteen inch clearance at the highest part in a cradle twenty-eight and one-half inches wide. As the hospital beds are thirty-five inches wide, this allows three inches on each side, which has proved sufficient to prevent slipping. The cradle is thirty-three inches long and as the blanket slopes at an angle toward the patient an even greater length is available for practical purposes. The beds are seventy-five inches long and it has been found feasible to use two cradles end to end in certain cases of extensive burns treated by the tannic acid method where heat and protection of the entire body was required.



Sheet zinc bent onto the frame constitutes the inner lining and reflector and the outer side of this is covered with three layers of asbestos applied and fastened together with paste.

The wiring is led through two-wire flat No. 14 BX insulator held in place with clips. A terminal box with plumber's "T" fitting is fastened to the top center of the cradle with machine bolts and two sockets attached so that the twenty-five Watt light bulbs are thirteen and one-quarter inches above the bed. A second terminal box is fixed at the center of one base, and a three-quarter inch Federal bushing with rubber hose lining is used for the exit of the wires.

The temperature under the cradle with one twenty-five Watt bulb turned on is eighty-six degrees Fahrenheit, and with both bulbs on it is ninety-four degrees Fahrenheit. These readings vary somewhat with the temperature of the room, but by the judicial use of the proper number of blankets placed over the cradle and tucked in under the mattress on the sides, the part played by the extraneous cold may be reduced to a minimum.



There has never been any dangerous overheating of the bedclothes over the cradle, and it would seem that if greater heat were desired, bulbs of higher candlepower could be used without in any measure jeopardizing the safety of the appliance. No burns of the patient's extremities have occurred during the two years that this type of cradle has been in use.

The cost of the materials of such a cradle is approximately twelve dollars and the labor in its manufacture, thirty dollars.

The cradle is heavy, weighing thirty-three pounds, but the nurses concerned with moving it were unanimous in declaring that they would rather handle this type because it was firm, than the invariably unstable, lighter type. It is rarely necessary to actually lift the cradle, as turning it up on end and letting it slide over the edge of the bed in an inverted position onto the floor suffices to expose the patient for care of the back, dressings, etc.

A similar cradle built of aluminum along the same designs, save for additional strap reinforcements below the lights which also serve as handles, weighing approximately one-half as much as the one pictured, has recently been completed at only a slight increase in cost. This cradle, however, is not so stable; has a tendency for the sheet of aluminum to crack where it is bent over the frame, and can be endorsed as a more feasible type only after further use.

*From the Peripheral Circulatory Clinic of the Massachusetts General Hospital.

†Faxon—Assistant in Surgery, Harvard Medical School. For record and address of author see "This Week's Issue", page 176.

MEDICAL PROGRESS

PROGRESS IN DIAGNOSIS AND TREATMENT OF SYPHILIS, 1929

BY AUSTIN W. CHEEVER, M.D.*

PROGRESS in the control of syphilis made in 1929 was rather in the nature of working over old material and of improving the tools we then had than of making discoveries or shaping new implements. The number of surveys made and the increasing number of statistics suggest a turning of attention to the problem of syphilis as a public health matter, and an inclination to work more intensively for prevention. The use of bismuth arsphenamine sulphonate, reported as a new drug in 1928, is increasing; thermotherapy is still being experimentally studied, and the Hinton glycerol-cholesterol precipitation test continues to gain in popularity.

SYPHILIS AND PUBLIC HEALTH

Matthias Nicoll, Jr., New York Commissioner of Health, speaking at the annual conference of health officers and public health nurses at Saratoga Springs in June, 1929 (*Health News*, Albany, 6:105, 1929), characterized the control of venereal diseases as one of the specific health problems regarding which "there is an ever-increasing interest on the part of the people generally, a great deal of discussion, and comparatively little accomplishment". After mentioning the difficulties that stand in the way of dissemination of knowledge on the subject, he said, "In spite of these various obstacles there can be no question but that public health education in social hygiene is producing results certainly among the younger generation and the more intelligent class of people."

Mahoney, Surgeon in the United States Public Health Service, in his impressions gained through visits to about eight of the leading German clinics (*Ven. Dis. Inform.*, 10:374, Sept. 20, 1929) comments on the apparent widespread belief in that country of a decline in the disease, quite in contrast with the general feeling in this country as well as in some of the countries abroad. For instance, in France (Jeanselme in *Health and Empire*, London, 3:251, 1928) an attempt is being made to account for the present recrudescence of syphilis in the Paris district, where there has been a steady upward trend since 1925. The factors entering into the problem have been resolved into: the gradual substitution of bismuth for arsphenamine, the small number of women being treated, discontinued treatment in about two-thirds of patients, loss of time in diagnosing chancres, and increase of clandestine prostitution.

That syphilis may be a much more important public health problem in the Southern States than malaria, pellagra, or hookworm is indicated by data collected in a health survey of fourteen cotton plantations in the "Delta" region of Mississippi. Here among a population of 2500 colored, approximately 25 per cent. showed positive Wassermann reactions. (*Ven. Dis. Inform.*, 10:281, July 20, 1929.)

Of the 10,000 men entering the California State Prison at San Quentin from 1918 to 1926, 9.21 per cent. showed positive Wassermann reactions, as reported by the resident physician. (*J. A. M. A.* 92:1238, April 13, 1929.) The percentages of infection by groups were approximately as follows: yellow race 24, Mexicans 16, negroes 18, whites 7. Fifteen per cent. of the 10,000 prisoners gave a history of "venereal sore" (chancre, chancroid, herpes, or venereal wart) and 48 per cent. gave a history of gonorrhea. In the last fiscal year (*J. A. M. A.* 93:1739, Nov. 30, 1929) the medical staff attached to Sing Sing Prison administered more than 7000 injections of arsphenamine. A survey of the last 6000 men received there showed a positive Wassermann percentage of 12 among the white population and 42 among the colored. Keil (*J. A. M. A.* 94:2084, June 28, 1929) gives figures for the largest penitentiary in the United States relative to population (Ohio Penitentiary). From 2000 men received there from May 3, 1928 to September 5, 1929, 378 had positive reactions.

The American Social Hygiene Association in collaboration with the United States Public Health Service and other agencies has studied the problem of venereal disease in many communities. (*M. Times*, 62:65, 1929.) An examination of 460 Indians on the Klamath Falls Reservation disclosed that venereal disease ranks with tuberculosis in prevalence. Ruling out doubtful cases, 4.8 per cent. of the Indian population had a definite diagnosis of venereal disease and 4.3 per cent. were definitely tuberculous. An analysis of the histories of one thousand seamen entering the port of New York was made by these agencies. The details of this very elaborate report prepared by Annabel M. Stewart appear as reprint No. 1365, Public Health Reports, United States Treasury Department. It is hoped that from the facts disclosed by this study will come about a closer coördination of effort among the agencies working for seamen. Districts such as New York City, St. Louis, De

*Cheever—Physician, Clinical and Consultant, Department of Skin and Syphilis, Boston Dispensary. For record and address of author see "This Week's Issue", page 176.

troit, Cleveland, rural communities in Kansas, Tennessee, Virginia, and New York have been studied. The reports contain many excellent charts and are not subject to brief review. Nelson and McGillicuddy for the Massachusetts Society of Social Hygiene and the Board of Health of Massachusetts have reported on prevalence in Holyoke, Mass. (*Ven. Dis. Inform.* 10:224, May 20, 1929.) The original articles can be consulted by anyone interested in this phase of the problem.

The public seems to be realizing, little by little, the importance of this question and various agencies are working toward prevention. Public Health Bulletin No. 184, prepared by direction of the Surgeon General, United States Public Health Service, 1929, gives abstracts from the health departments of States and Provinces of the United States and Canada showing what is being done in the way of raising funds and passing legislation toward the administration of venereal disease control. Not only has the Massachusetts Department of Public Health coöperated with the syphilologist, venereal disease clinics, and the general practitioner, to the extent of distributing free arsenicals, a detailed report of which may be studied (*New Eng. J. Med.*, 201:761, Oct. 17, 1929), but in order to help patients to understand the need of sufficiently continued treatment, this same Department through Dr. N. A. Nelson, has had prepared for distribution to physicians throughout the State a statement of Minimum Standards for the Diagnosis, Treatment, and Control of Syphilis. (*New Eng. J. Med.*, 200:1038, May 16, 1929.) This pamphlet is ideal for the doctor to take up with the patient or to hand the more intelligent patient for his careful study.

During the year there was in existence a joint committee appointed by the Massachusetts Department of Public Health and the Massachusetts Society for Social Hygiene to study local medical problems in venereal disease control. E. Granville Crabtree (*New Eng. J. Med.*, 201:362, Aug. 22, 1929), has analyzed the answers of 106 physicians replying to his questionnaire, and has summarized them as follows:

"It is evident that a large majority of practitioners treat venereal disease but that few desire to do so; that those who are not specially trained recognize the fact and desire to be trained, but would rather refer their cases to specialists if they were more generally available.

"It is evident that the patient requires instruction which will convince him of the necessity for remaining under treatment even though the disease is no longer symptomatic and that some provision must be made in communities which have no clinics for the treatment of patients not able to pay."

SYPHILIS AND LIFE INSURANCE

Vajda (*Klin. Wchnschr.* 8:221, 1929) reviews carefully the relationship between life insurance companies and life insurance policyholders. The author feels that a patient conscientiously treated for four to five years shows only slight divergence in longevity from the normal and recommends a normal premium for such people if the policy is to run 15 or 20 years, but at an increased rate if the policy is for a longer period. He feels that the majority of syphilities are not well treated and that there is a supermortality of 68 per cent. in syphilitics. His figures relate only to patients who have communicated the fact of their syphilitic infection to the insurance physician as the examinations are not sufficiently detailed in the main for syphilis not admitted to be detected. For obvious reasons those with active syphilis do not apply for life insurance.

SEROLOGY

Hinton and Stuart (*J. Lab. & Clin. Med.* 14:621, 1929) have described modifications in the Hinton glycerol-cholesterol agglutination reaction. In order to overcome certain difficulties the technic has been modified slightly. Originally, clearing alone was considered an indication of positivity, but with the modified method the criterion of positivity is the visible agglutination of the dispersed particles of cholesterol. Hinton and Berk (*New Eng. J. Med.* 202:1054, May 29, 1929) describe a second modification in the technic of this test for syphilis. By slightly modifying the original method and adding a supplementary procedure they have now produced a test as simple and as easily read as the original one but more sensitive and dependable.

That the use of the Hinton test is increasing is indicated by the number of studies being reported, comparing it with the Wassermann and other reactions. Munter (*J. Lab. & Clin. Med.* 14:665, April, 1929) analyzed 2,331 consecutive Wassermann and Hinton reactions on 2,120 patients in the Peter Bent Brigham Hospital. In the 6.6 per cent. of cases where the two tests disagreed, the Hinton was the one which agreed with the clinical evidence two times out of three. In this series the error in the Wassermann results was 2.3 per cent. as compared to 1.3 in the Hinton. He characterizes the test as simple, easily read, sensitive, requiring less labor, apparatus, and material than the Wassermann.

The Hinton test definitely raises the "height of the therapeutic hurdle" in the opinion of C. Morton Smith (*Arch. Dermat. & Syph.* 19:439, March, 1929) since, in order to obtain and retain a negative reaction by it, a more intensive and persistent treatment is required than in the case of a negative Wassermann, judging from his experience in the use of a Hinton reaction and, in several instances, a Kahn test in addition to the Wassermann on many of his patients for a year. Its advantages as he sees them are: a smaller number of doubtful readings; an earlier positive reaction than the Wassermann; a reduction of false positives; the ease of reading; its application to spinal fluid. In short, he feels that it is apparently

more nearly a specific test for syphilis than the other reactions.

Osmond (*Brit. M. J.* 2:666, Oct. 12, 1929) feels that the Hinton test can claim to be the equal, at least, of the Wassermann, Kahn, and Sigma tests, and that it is the easiest to perform and far easier to read than the Kahn or Sigma test, its only difficulty being the standardization of the antigen. He bases his statement on his comparison of the Hinton with the Wassermann in 500 serums with absolute or relative agreement in 91.6 per cent. Of the 42 cases in which there was disagreement the Wassermann test appeared to be correct in 25 and the Hinton in 17. The percentage of agreement is the more remarkable, in the author's opinion, when one considers that a large proportion of the serums were borderline ones from treated cases. In comparison with the Kahn test in 201 serums there was disagreement in 14 cases, 7 of which were in favor of the Kahn and 7 of the Hinton. He compared the Hinton and Sigma tests in 137 serums; of the 10 in which there was disagreement, 6 favored the Hinton and 4 the Sigma.

Some technical modifications of the Hinton test are submitted by Ferguson and Greenfield. (*Brit. M. J.* 1:492, March 16, 1929.) They give figures of agreement in 460 cases where the Kahn, Hinton, and Wassermann were performed and they arrive at the conclusion that the Hinton test is economical, simple, and highly sensitive,—more sensitive and reliable than the Kahn, but, like the Kahn, it should be reserved as supplementary to the Wassermann reaction.

From extensive studies in the military service, Craig (*Am. J. Syph.* 13:206, April, 1929) concludes that the Wassermann test should be retained as the standard method for the diagnosis of syphilis in military service and that, so far as possible, the Kahn should be used in conjunction with it.

Niederwieser and Lauter (*Ztschr. f. Kinderh.* 46:263, 1928) discuss the advantages of the micromethod for serodiagnosis for children's clinics, where it is many times impossible to get sufficient blood for a standard Wassermann. In 4000 cases from one of the children's clinics in Germany the micromethod of Meinicke has been found equal to the Wassermann test. The authors give a technical description of another micromethod, the Muller-Landsteiner test, which is popular in Austria.

A Second Serological Laboratory Conference on the Serodiagnosis of Syphilis was held May 21 to June 4, 1928, at the Danish State Serum Institute at Copenhagen. During the conference 944 blood serums and 555 specimens of cerebrospinal fluid were tested. The conclusions reached by the conference and stated as resolutions are not subject to brief review, but the full report may be read in the Series of League of Nations Publications, III, Health, 1929, III. 3. Official No. C. H. 726, Geneva, December, 1928. A detailed review appeared in *Venereal Disease Information*, 10:6, June 20, 1929.

RESEARCH

There has been controversy, recently, as to whether the incidence of neurosyphilis has increased since arsphenamine treatment has become general and whether neurologic symptoms appear earlier in patients treated with arsphenamine. Because the Army Medical Corps has the reputation for thorough and prolonged treatment of syphilis with arsphenamine and mercury, it is of especial interest to have such an analysis of 280 clinical records from neuropsychiatric patients in the Walter Reed General Hospital as has been made by Weatherby. (*Am. J. Syph.* 13:339, July, 1929.) These figures show no evidence that treatment with arsphenamine in the early stages of syphilis predisposes to the development of paresis, but they do indicate that arsphenamine appears to predispose to early onset of cerebrospinal syphilis, though untreated patients with apparently late onset might have had early cerebrospinal involvement which might have been discovered if earlier examination had been made. The factor of neglect does not seem to play such an important rôle in tabetics and cases of psychosis with cerebral syphilis as it does in the paretics, but the majority had no previous treatment. In spite of malaria at various intervals of time after syphilitic infection, paresis and other forms of neurosyphilis can develop.

For increased understanding of the fate and distribution of the mercurials we are indebted to Young et al., who found that the rate of the excretion of mercury was heightened by the ingestion of acids and retarded by alkali. In a paper read before the Section on Dermatology and Syphilology at the meeting of the American Medical Association in Portland, Oregon, 1929, they reported that they also proved that insoluble mercury compounds given intramuscularly are excreted over a more prolonged period than the soluble forms, and that the soluble and insoluble mercury compounds penetrate into the cerebrospinal fluid. The storage of mercury in the bones, and to a lesser extent in the liver, is influenced by the acid of the diet and the administration of acids and alkalis.

In order to determine how much bismuth is retained in the organism after treatment with it for syphilis, Lomholt (*Arch. Dermat. & Syph.* 19:891, June, 1929) undertook a series of six experiments on guinea-pigs. He agreed with former investigators as to the distribution of bismuth in the body: a large concentration in the kidneys and the intestine, a moderate amount in the liver, spleen, etc., much less in skin and muscular tissue. The rate of absorption varied greatly, smaller injections apparently absorbing more quickly than larger ones. In 5 cases, more than 50 per cent. was absorbed after ten days. Montlaur (*Ann. de dermat. et syph.*

10:259-268, March, 1929) has produced roentgenograms showing that bismuth salts (insoluble) are retained from three to four months after injection, and that water soluble preparations remain for a short time as injected and soon become dissociated and precipitated. The author is now studying the new oil soluble bismuth compounds.

The absorption rate in man of seventeen different brands of bismuth and in rabbits of fifteen of these has been studied by Templeton, Rix and Thomson. (*Tr. Sect. Dermat. & Syphilol., A. M. A.*, Portland, Oregon, July, 1929.) Their results in rabbits vary so much from the results in patients that they attempt no therapeutic recommendations. They feel that there is much need of further investigation correlating clinical observations, serologic tests, roentgenologic records, dosage and chemical and physical characteristics of the brand of bismuth, as well as the age, sex, and previous treatment of the patient and the duration of the disease.

Some interesting microscopic studies of the changes following the administration of antisyphilitic drugs in rabbits, guinea-pigs, and dogs have been done by Gruhzit. (*Arch. Dermat. & Syph.* 19:943, June, 1929.) His excellent photomicrographs show the pathologic changes induced at the sites of the injections by arsenic, mercury, and bismuth in water solutions and in oil suspensions. The arsphenamine type of drugs intramuscularly results in formation of sterile abscesses and mercury compounds cause the same type of injury in lesser degree, while bismuth compounds produce local injury according to the degree of their corrosiveness, the least injury being done by the water-soluble, tissue-fluid soluble compound such as bismuth thioglycollate.

In 1920 Warthin and Starry recorded a more rapid and improved method for the demonstrating of spirochetes in tissues and the next year published a second improved method for the same. But not feeling wholly satisfied because the results obtained by it are not always uniform, Warthin now offers a starch-gelatin modification of this silver-agar method which is much more convenient and specific, yielding more uniform results with a higher percentage of positive demonstration of the organism. (*Am. J. Syph.* 13:454, July, 1929.)

The Spirocheta pallida is receiving considerable attention this year culturally. Beginning with Volpino and Fontana in 1906, and continuing to the present time, there have been many recorded attempts to cultivate this organism from human and rabbit syphilitic tissues. All the literature upon the alleged successful cultivation has been very carefully reviewed by Kast and Kolmer (*Am. J. Syph.* 13:419, July, 1929) in connection with their description of their own unsuccessful attempts. They feel that it is highly probable that many of the alleged successful cultivations of spirocheta pallida have been growths of pallida-like saprophytic spirochetes. Using a wide variety of methods and employing seventeen different kinds of culture media, the authors failed to cultivate spirocheta pallida from human and rabbit syphilitic tissues though saprophytic spirochetes from smegma and saliva have been successfully cultivated. This constitutes a problem of importance in syphilis research. Kolmer (*Arch. Dermat. & Syph.* 20:189, August, 1929) has been studying the spirocheta pallida, also, from the point of view of the toxin production, for although some of the symptoms of syphilis suggest the production and activity of such toxins, they have not been demonstrated. While experiments indicate that cultures of spirochetes believed to be spirocheta pallida do not produce demonstrable amounts of soluble or exogenous toxins in vitro, the results are of limited value since it is doubtful if spirocheta pallida, particularly the strain virulent for rabbits, have been really cultivated. Joseph (*Klin. Wchnschr.* Jan. 15, 1929) has been experimenting with a culture of spirochetes, trying to decide if skin reactions with this are of practical value for the diagnosis of syphilis. After performing skin tests with the culture on 250 syphilitic patients, control tests were made on a number of non-syphilitics and a comparison of the two groups revealed practically no difference.

That serum prophylaxis and treatment for syphilis is not possible by present methods is the conclusion of Kolmer and Rule (*Arch. Dermat. & Syph.* 20:90, July, 1929) after experimental work with rabbits, testing the spirocheticidal activity of the human syphilitic serum and the immunologic significance of the Wassermann reaction. They found that the freshly prepared serums from chronic, latent and active cases of syphilis in which the patients had positive serology were no more spirocheticidal in vitro than the serums of normal non-syphilitic persons. Apparently no part of acquired immunity in syphilis is essentially humoral because of the absence of demonstrable amounts of spirocheticidal antibody in the serum.

Jarcho (*J. Lab. & Clin. Med.* 14:1097-1103, Aug. 1929) considers routine examination of the milk from the sixth to ninth day postpartum a convenient means of employing the Wassermann test in maternity practice. He found that the reaction remains positive in the milk of syphilitic women until about the sixteenth day, when it begins to weaken and gradually to disappear. He has performed parallel milk and blood tests upon 107 colored puerperal patients and discovered substantial agreement in 95 per cent. of the cases and exact qualitative and quantitative agreement in 89 per cent.

From time to time mention has been made in literature relative to the efficacy of copper as an antisyphilitic drug. Klauder and Stalnaker (*J. Chemotherapy*, 6:1, April, 1929) conducted experiments with colloidal copper injected intravenously in syphilitic rabbits. They found that dosage which was just sublethal failed to show

any evidence of spirocheticidal action. The course of the syphilitic infection was uninfluenced after one month's observation. Because of this decisive negative result, other preparations of copper were not studied and the drug was not employed clinically.

TREATMENT

A very detailed survey of the records of cases of syphilis in men dealt with at St. Thomas's Hospital, London, from January, 1920 to March, 1926, is given by Col. L. W. Harrison in a special report published in 1929. (Special Report Series, No. 132, Medical Research Council, pub. by His Majesty's Stationery Office, London.) He found no important differences in effects from different brands of arsenicals. In a small series he did not find the combination of mercury and arsenic any better than the combination of bismuth and arsenic, but he found the latter courses better tolerated. His standard course consisted of at least 5.0 Gm. of an arsenical and 0.3 Gm. of mercury or 2.0 Gm. of bismuth over a period of not more than four months. He concluded that at least two such courses must be given in the seronegative primary cases; while three full courses will not assure permanency of negative reactions; that most relapses occur during the first year; that some cases appear to show permanent eradication of the disease with very small dosage, while others show failure in some early cases even with very persistent treatment, suggesting needed research along the line of patient's tissue reaction, as well as an attempt to find more suitable drugs.

A plea for more conservative dosage of the arsphenamines is voiced by Schamberg. (*Arch. Dermat. & Syph.* 20:431, Oct. 1929.) He speaks from an experience of 20,000 injections of neoarsphenamine given in his clinic during the last three or more years, during which time there have been no fatalities, no jaundice, or any serious complications. He attributes this immunity to a cutting down in the dosage, usually giving 0.45 Gm., frequently 0.3 Gm., of neoarsphenamine, and possibly, though not certainly, to the quality of the drug and the technic employed. He also reports excellent therapeutic results from simultaneous treatment with bismuth and neoarsphenamine, and he believes the clinical results are at least as good, if not better, than when weekly doses of arsphenamine alone had been given.

Phelps (*U. S. Nav. M. Bull.* 27:205, 1929) reports an analysis of 191,778 doses of neoarsphenamine and other arsenical compounds given during nearly four years. He noted 126 mild reactions, 41 severe, and 11 fatal ones. The number of fatal reactions from arsphenamine and neoarsphenamine were approximately equal. No severe reactions were reported from sulpharsphenamine and only one mild one in 4,488 doses of tryparsamide.

With a view to using it under conditions where malarial therapy was inadvisable and for the purpose of investigating its effect on aspects of syphilis other than neurosyphilis, Kemp and Stokes (*J. A. M. A.* 92:1737, May 25, 1929) administered fever therapy by means of mixed typhoid-paratyphoid vaccine and pronounced this a safe and controllable form of therapy except where absolutely contraindicated by myocardial and advanced cardiovascular disease. This treatment alone will cause involution of primary and secondary manifestations, but as a method of treatment it is inferior to arsphenamine and bismuth therapy alone. In neurosyphilis bacterial protein therapy alone or with arsphenamine or tryparsamide can produce marked serologic and clinical improvement.

Jacobi discussed the technic of cistern puncture and concludes that it is a safe method of obtaining spinal fluid. Because the after-effects are so transient and insignificant in comparison with those following lumbar puncture, he feels that this method is likely to replace the other, especially since it can be performed without interfering unduly with the patient's activities. (*Arch. Dermat. & Syph.* 19:651, April, 1929.) Ritzefeld (*Dermat. Wchnschr.* 87:1678-1681, Oct. 27, 1928) is also enthusiastically in favor of cistern puncture since even children could be punctured, he found, by one person without assistants. Of the 477 cistern punctures done at the dermatological clinic of the General Hospital of St. Georg, Hamburg, no untoward results were noticed even in patients with epilepsy, deformities of the spine, or obese patients, and no ill results followed the puncturing of a person with brain tumor. Where patients refuse lumbar puncture, they accept cistern puncture, which may be used in ambulant treatment.

The first use of spirocheta morsus-muris, the rat-bite fever organism, in the treatment of paresis in this country was made by Solomon, Berk, Theiler, and Clay of Boston, and their encouraging report on it stimulated Hershfield and his co-workers to try this form of therapy in some of the paretic patients in a few of the Illinois state hospitals. After one year of observation, they report 50 per cent. of the patients were more or less physically improved, 60 per cent. did not show any difference mentally, 10 per cent. at first showed improvement mentally and then became worse. Only two deaths could be directly attributed to the rat-bite fever infection. (*J. A. M. A.* 92:772, Mar. 9, 1929.)

"That the golden opportunity in the treatment of syphilis lies during the sero-negative period" is the conclusion of Chargin and Stone after a study of 444 patients with early syphilis. (*Arch. Dermat. & Syph.* 19:750, May, 1929.) Of this special group 36 presented themselves with primary lesions, darkfield examination proving positive and the Wassermann reaction negative; of these, 33 became apparently cured. The authors consider it worthy of note that 11 of this group received only a single course of

treatment, that is from six to eight injections of arsphenamine and from twelve to fifteen injections of mercury or bismuth, thus emphasizing the importance and value of early diagnosis and early intensive treatment. Delay in treatment seemed greatly to reduce the probable cures; therefore the darkfield examination and early treatment are prime factors in the control of syphilis.

Basing his doubt on roentgenograms taken at varying intervals after the administration of intramuscular bismuth and showing much of the metal unabsorbed in several instances, Erdman (*J. A. M. A.* 92:1252, April 13, 1929) raised a question concerning the absorption of bismuth. Boyd (*J. A. M. A.* 93:269, July 27, 1929) replied that in his experience bismuth is absorbed. From roentgenograms and reports of 11 cases he is certain that potassium bismuth tartrate in the proper dosage, at the proper interval, and with proper technic and massage of the buttock is satisfactorily absorbed.

While a longer period of observation is necessary for final evaluation of results, Montgomery (*Proc. Staff Meet.*, Mayo Clinic, 4:122-124, April 17, 1929) has found bismuth arsphenamine sulphonate (bismarsen) a very satisfactory drug in the treatment of acute syphilis in elderly persons and in those in the serologically negative stage of chancre. He attributes the relapse of five cases out of twenty-four thus treated due to the lowered resistance of the patients and not to the drug.

The use of mercurial ointment has been put on a more definite basis through the studies on absorption as measured by excretion by Cole, Schreiber, and Sollman. (*Tr. the Sect. Dermat. & Syphilol. A. M. A.*, Portland, Oregon, 1929.) Their observations on 5 per cent., 25 per cent., and 50 per cent. mercury preparations show that the excretion is about in proportion of the concentration in the ointment used. Colloidal mercury ointments, mercury in an oleate base, or in a stiff petroxolin base showed no especial difference in excretion of the metal than when it is used in the ordinary benzoinated lard and suet base. A thirty per cent. mercurial ointment in massive or intensive weekly inunctions gives equal or higher excretion than the simple, daily 50 per cent. "clean" ointment or daily intramuscular injections of binbromide of mercury.

Shaffer (*Arch. Dermat. & Syph.* 19:347, March, 1929) presented what he considered a rather elementary paper to make clear the dispersion of intramuscular injections. He correlated the anatomy and technic of the injections and showed that the gluteus maximus muscle offers special anatomic features for local injections, while injections into the lower central portion of the buttock endanger the greater sciatic nerve. Irritation of the small sciatic nerve, lying immediately over the great sciatic nerve in this area, probably produces the more common and temporary sciatic-like pain extending down the back of the thigh. Injections made deeply into the gluteus medius or minimus muscles are not well tolerated. Roentgenograms taken at intervals up to one week after injections of iodized oil and bismuth salicylate failed to show dispersion of the fluid after the first few minutes. They showed a curved linear distribution when injected within the gluteus maximus, and the same or even more sharply defined linear distribution when injections of a suspension of metallic bismuth in isotonic dextrose solution were made. Fluoroscopic study showed that oily suspensions spread rather slowly in from one to five minutes, but that aqueous suspensions disperse to their final confines almost at once. Injections of oily substances should be given intragluteally since this method favors dispersion and absorption.

Petges and others (*Paris Med.* 1:224, Mar. 2, 1929) consider that mercuric cyanide should be the medication of choice in cases of syphilitic albuminuria, because of all the mercury preparation this is the one that possesses spirocheticidal properties and a marked diuretic effect and is well tolerated by the kidneys. In three cases under their observation of acute syphilitic nephritis in patients with primary syphilis, the albuminuria disappeared after about fifteen days' treatment with intravenous injections of this drug, and the use of arsenic and bismuth was made possible.

Sulphur in the colloidal form gave such good results in the nine cases of "metasyphilis" where Pollak (*Med. Klin.* 25:671-672, April 26, 1929) employed it, that he concludes that that treatment compares favorably in its results with malarial therapy and eliminates some of the difficulties of the latter form of treatment.

Wenger of the U. S. Public Health Service (*Ven. Dis. Inform.* 10:323, Aug. 20, 1929) studied the effects of hot baths in 39 cases of previously untreated syphilis and he concluded that in the early stages of the disease, hydrotherapy in conjunction with the usual treatment is of definite value. Cady and Ewerhardt (*Am. J. Syph.* 13:313, July, 1929) have made some limited but laborious investigations of the usefulness of thermotherapy in Wassermann-fast patients. The data suggest, but do not prove, that the serologic reactions are rendered less stable during the relatively short periods of this treatment. However, the improvement in the patient's sense of well-being and the apparent serologic responses in a small percentage of cases have led them to continue their studies along this line.

In order to prevent anaphylactic shock after the administration of arsenicals, Gougerot and others (*Ann. d. mal. vén.* 24:81-106, Feb. 1929) dissolve the preparation to be used in from 5 to 20 c.c. of a 10 per cent. solution of cesium eosinate immediately before its administration. For treatment of anaphylactic reaction they inject from 5 to 10 c.c. of the same solution of cesium eosinate intravenously. This method failed to give results in only three of fifty cases of reported reactions.

IN GENERAL

A case illustrating that sensitivity to arsphenamine may continue for many years after treatment is related by Birke. (*Dermat. Wchnschr.* 89:1357-1358, Sept. 21, 1929.) A patient with a seronegative primary syphilis was treated with old arsphenamine, receiving a total of 1.6 Gm. in four doses within twenty days. Three days after the last dose he developed an arsphenamine dermatitis with severe constitutional reaction and later, exfoliative dermatitis. Sixteen years later he presented himself at a nerve clinic showing progressive syphilis with mental symptoms. Mercurial therapy was started and one dose of neoarsphenamine was given intravenously. Two days later an exanthem appeared and soon became generalized, and progressed into an exfoliative dermatitis. The picture at the time of the patient's death was that of a pemphigus foliaceus.

Stookey (*Tr. Sect. Dermat. & Syphilol. A. M. A.*, Portland, Oregon, 1929) called attention to the cervix uteri as a common site of the primary lesion of syphilis. A tissue reaction may be only an extreme edema. A diagnosis can be made clinically only by darkfield or biopsy.

Roche (*Marseille méd.* 1:287-290, Feb. 25, 1929) described a condition which he calls "flat tongue" caused by paralysis of the transverse lingual muscles with the result that the patient cannot raise the lateral edges of the tongue to form a roll. Since he found this condition present in nine out of ten patients with congenital syphilis, the author thinks that it is as valuable a sign as are Hutchinsonian teeth and interstitial keratitis.

After consideration and study of the tubercle of Carabelli as a possible stigma of congenital syphilis, Eller (*Arch. Dermat. & Syph.* 20:221, Aug. 1929) decides that it is not of diagnostic value, for he finds that this tubercle is frequently present in those not congenital syphilitics and absent in many who are.

The use of neoarsphenamine intraperitoneally for congenital syphilis has been tried by Yampolsky (*J. M. A. Georgia*, 18:444-448, Oct. 1929) in over twenty cases. The method is simple and requires only sterile instruments; there is no danger or discomfort to the patient, and absorption is very rapid from the peritoneal cavity. The author feels that the difficulties of intramuscular or intravenous treatment of congenital syphilis are greater than those by his method.

Olsen (*Am. J. Syph.* 13:463, July, 1929) compares the staining methods of Spirocheta pallida in tissue. Congenital material stains readily by any method but gives the most satisfactory results with those of Jahnel, Warthin-Starry, and Dieterle. The latter method was best for the tonsil tissue and brain, but in the aorta the improved Warthin-Starry method was the only one to give good results, an item of considerable importance when one considers the frequency with which the aorta is affected in syphilis.

The inability of neoarsphenamine in ordinary dosage to prevent the development of Vincent's angina was illustrated by a case reported by Williams (*Arch. Dermat. & Syph.* 20:322, Sept. 1929) of a woman who developed this condition while under treatment for syphilis.

Constantinescou and Vatamanu (*Ann. d. mal. vén.* 24:161, March, 1929) reported a case of syphilitic rash which was not preceded by a chancre, but which appeared seventy-five days after a blood transfusion. The donor's Wassermann reaction was positive and he had had a mixed chancre at the time of the transfusion, though he did not know the condition was syphilitic. Freuchen (*Ugesk. f. Laeger*, 91:386, May 2, 1929) calls attention to three instances of syphilis given by transfusion, the donors having early syphilis, and he strongly urges close supervision of donor material. This author calls attention also to the interesting experiment of McNamara in Panama when ten non-syphilitic patients were given blood from persons with tertiary syphilis and twenty-four weeks after the last transfusion none presented signs of infection.

That a routine eye examination is advisable for all patients with a positive blood reaction, and a Wassermann test of all patients with an eye condition the etiology of which is unknown or doubtful, is the opinion of Rodin and Carson (*J. A. M. A.* 93:360, Aug. 3, 1929) after a study of 1000 consecutive case histories of eye conditions in patients with positive blood Wassermann reactions. Eye lesions were found in 35 per cent. of the seropositive patients, and in about one-half of this number the eye symptoms were the first manifestation of syphilis of which the patient was aware. Practically every pathologic eye condition was present and the greatest age incidence occurred between 40 and 50.

From his experience with 4,300 consecutive new patients admitted to the Medical Section of the John Sealy Hospital Out-Patient Department, Kopecky (*Am. J. Syph.* 13:332, July, 1929) feels that all patients with obscure headaches should have the benefit of a painstaking examination for syphilis. Of these patients 882 had syphilis; 632 of them complained primarily of pain which appeared to be of syphilitic origin; 131 gave as their chief complaint headache which seemed to be toxic or functional in origin, evidence of structural changes being present in only a small number.

Previous cases of arterial embolism following intragluteal injections of bismuth are reviewed by A. Martins de Castro (*Ann. de dermat. et syph.* 10: 161-177, February, 1929) and he records a case in his own experience in which gangrene developed. Pathologic study showed bismuth in amorphous form partially blocking the arterial tree. This author found that the chief pathologic changes were embolism of the arteries of the derma and hypoderm, disorganization of the sebaceous glands, and dilatation of the papillary capillaries.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 17041*

EDEMA BELOW THE WAIST WITH DEHYDRATION ABOVE

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. EDWARD G. THORP: This is the case of a Swedish sexton fifty-six years old who entered the hospital September 30 last complaining of generalized edema of the abdomen, scrotum and legs of six weeks' duration.

Four years before entry he noticed the onset of progressively increasing constipation. Two years before entry he had epigastric pain, a constant dull pain and occasionally a sharp stabbing radiating pain across the upper abdomen, primary in the right upper quadrant. This came on one to two hours after meals. It was relieved by food and soda and made worse by fatty foods, fruit and vegetables. Crackers relieved it. Seven weeks before entry the pain ceased entirely. Six weeks before entry the edema commenced. At first he noticed it only at night in the ankles, but for four weeks it had been constant and he had noticed pitting up to the abdominal wall. His belt was about four inches too short. He had had progressively increasing dyspnea for four weeks. His doctor said that a year before this he was definitely jaundiced for three months and had clay-colored stools. The man himself did not know this.

The past history was negative except for considerable beer and an occasional whiskey for several years until the advent of prohibition, since when he had taken no alcohol whatever.

Examination showed a well developed thin and dyspneic man. The fundi showed extensive old chorioretinitis. Both diaphragms were high, and there seemed to be signs of fluid at both bases. The position of the apical impulse of the heart was in the 4th interspace 3 centimeters outside the midclavicular line. It was thought that the heart was displaced rather than enlarged. A systolic blow was heard at the aortic area. The blood pressure was 110/75 to 122/80. There was marked ascites and generalized edema of the feet, ankles, arms and legs.

Extensive laboratory studies were made. The urine showed a trace to a large trace of albumin. The sediment showed leukocytes constantly and red cells at 12 of 19 examinations, on three occasions as many as 30 to 40 per field. Occasional hyalin casts were noticed. A two-hour test showed a high fixation of gravity, 1.030 to 1.045. The renal function was 25 per cent. The initial red count was 5,310,000, the hemoglobin 60. After two weeks the red count was 3,200,000, the hemoglobin 35. He was transfused at that time because of the anemia and the low serum protein. This had no effect on the red count. The leukocyte count was at first 15,000; then it jumped to 20,000 and back to 17,000 and 18,000. The sputum was grossly blood tinged. There were no tubercle bacilli. There were several long chains of yeast-like Gram-positive organisms. The basal metabolism was —3, pulse 68, weight 66 kilometers. A Hinton test was negative. The non-protein nitrogen was between 40 and 50. A few days before his death it was 49. The liver function and van den Bergh tests were both normal. The blood fat was 439 milligrams. The serum protein was 4 per cent. We transfused him because of the low serum protein. We thought the raising of the serum protein would be of value. The blood chlorides were 611. The cholesterol was not done early, but after he had been in the ward about a month. It was 185 milligrams. The uric acid was 4.9.

Chest films taken on admission showed pleurisy of the left base and some fluid. There was nothing on the right. He had carious teeth. Three weeks later chest films were interpreted as probable edema of both lungs and fluid at both bases. An eye consultant said that the fundi gave evidence of congenital lues.

Soon after the patient's entry we tapped his abdomen and got 3 liters of pseudochylous fluid, a cloudy, milky-appearing fluid. The fatty acid was done on this, and was 108 milligrams.

The temperature was normal at first; then it went up to 101° after five days. The pulse went up to 100 and the respirations to 35. There was no particular change in the chest findings at that time. He complained of pain in the left flank high up, almost at the costal margin. There was no rub and the fine crepitant râles he had at entry persisted. After a few days the temperature came down gradually to normal, but only for a week. After the second week there was rather a swinging temperature with an occasional rise to 101°. The pulse climbed steadily after the second week. There was a rub at the right base and fine crepitant râles along with the dullness. We thought he probably had some intrinsic lung infection as well as the fluid shown by x-ray. He became very weak. He was transfused, but this had no effect on the blood and the edema. Finally he lost all appetite. During the last week he was prostrated. He was mentally clear. He was dehydrated in spite of the edema. The upper part of his chest

*The following report gives the essentials of two discussions, one in Dr. Cabot's Third Year class and one at a conference of the hospital staff.

was emaciated. His tongue was very dry and harsh. Edema of the belly persisted throughout his whole stay. A week before his death for one day there was dull constant pain over the precordium, non-radiating. He was not relieved by nitrites. The aortic systolic blow persisted but did not change. Two days before death the temperature suddenly dropped from 102° to 97° by rectum. The pulse climbed from 140 to 150 towards the end. An area of dullness, râles and intense bronchial breathing was noted at both bases. On November 3 he died.

Clinical Discussion

BY RICHARD C. CABOT, M.D., AND
GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

Dr. Cabot: The history suggests peptic ulcer, but is not conclusive. The pain is more continuous than we expect in peptic ulcer. The patient ought to be entirely free from pain in certain parts of every day.

He had lost weight in spite of all this edema.

NOTES ON THE PHYSICAL EXAMINATION

We do not find in the examination of the heart any good explanation of this edema. Up to this point I have been assuming that he has the elderly man's heart disease, the hypertensive type of heart disease, but I was evidently wrong.

The range in the specific gravity of the urine certainly cannot be said to be limited in any sense. The only significant limitation of gravity is limitation at a low point. The renal function is perfectly normal. We have no good evidence of nephritis. The case is getting more and more difficult. First it looked like a heart case. Then that was pretty well ruled out. Then it looked like a kidney case. Now it is not at all clearly a kidney case.

The blood fat shows a marked increase. Normally it is 190 to 240.

The serum protein shows a marked decrease. The normal is 6 to 8.

The basal metabolic rate is practically normal. —3 is nothing. So the case cannot be put down to pseudo-edema or myxedema.

The blood chlorides are markedly increased, as they might be in nephritis. I do not know what else except nephritis increases them.

All those chemical tests, I take it, mean that they were thinking of nephrosis because they could not get a clean-cut diagnosis of nephritis. Nephrosis is being studied with a good deal of interest nowadays.

The x-ray shows evidence, I suppose, of fluid in the chest. From the heart shadow we cannot lay this case to heart disease.

The cell count in the ascitic fluid here is of very little significance. It hardly ever has much significance in abdominal fluid. It has some value in chest fluids, but very little in abdominal fluids. This is the sort of fluid we may get in almost any chronic abdominal disease.

When we can feel a friction rub it is very comforting,—then we are sure it is there. If we hear one we are not sure of it. We can feel sonorous and sibilant râles. If you had never felt one at all you might make a mistake. But if you feel a friction once it is there. It seems as if there was evidence of pneumonia and pleurisy or both, as Dr. Holmes led us to anticipate.

We must say infection of the pleura and presumably of the lung, which was the immediate cause of death. I am interested in that long-standing edema. We cannot put it down to any ordinary cause of edema, and that raises the question of nephrosis.

Dr. Tracy B. Mallory: The house officer's observation was that while the patient was edematous in the lower half of the body he showed definite dehydration in the upper half. There was a striking difference between the two.

Dr. Cabot: I suppose I ought to know enough to draw some conclusion from that. I do not know what that means unless he has nephrosis. I should say the diagnosis is either nephrosis or X.

The cholesterol is within normal limits.

DIFFERENTIAL DIAGNOSIS

I do not know any other causes for edema than those that I have mentioned and starvation, which of course we do not need to consider here. There are a few cases that I have seen coming from postmortem—I remember two—in which there was a combination of nephritis and nephrosis, so I am prepared for something like that in this case. Nephrosis is believed not to be a disease of the kidneys alone but of those along with other organs as in eclampsia, where there are lesions in the kidney but more particularly in the liver. If this is nephrosis I am prepared to hear Dr. Mallory tell us that there is nephritis also.

A Student: Wouldn't a liver cirrhosis account for the edema of the lower half of the body?

Dr. Cabot: The question of liver cirrhosis is a good point to bring up. I do not know that we can exclude it. We have no signs of portal obstruction aside from ascites, which is not a good sign. The edema is more generalized than we should expect. But Dr. Mallory makes the point that it was below the waist. This man had no jaundice, and he had an extraordinarily good liver function for it to be cirrhosis. That is a strong point against it.

A Student: Could an abdominal malignancy with partial obstruction in the vena cava give that combination of ascites and dehydration?

Dr. Cabot: I cannot see why it should. I have not known that particular thing to be ob-

served. I have seen rather general edema in cases of vena cava block.

A STUDENT: Could it be gastric cancer with metastasis? The history of peptic ulcer suggests possibly a cancerous degeneration.

DR. CABOT: And so metastasis producing the symptoms. That is a good suggestion. He had this stomach history early. But then he stopped having pain in rather a queer way. One does not expect carcinoma to stop giving pain when one once has it. I do not think ulcer can be ruled out here.

A STUDENT: Couldn't it have been a temporary gall stone that was felt in the common duct and then passed?

DR. CABOT: A stone in the common duct ordinarily gives marked fever. And I do not see why he should not get better from that.

A STUDENT: Could this nephrosis be due to lues?

DR. CABOT: Yes. I have known nephrosis to be associated with syphilis. That is a good point in view of what was found in the retina.

A STUDENT: Isn't edema of the legs consistent with cirrhosis rather than with nephrosis?

DR. CABOT: One gets edema of the legs and ascites in nephrosis as well as in cirrhosis. The general impression is that patients ordinarily complain of edema of the legs before anything else. I do not think cirrhosis can be ruled out except for the rather strong point against it of the normal liver function test. But I am not satisfied to rely on a single test alone.

A STUDENT: Doesn't the milk-like fluid go well with nephrosis?

DR. CABOT: Yes, but it is not at all characteristic.

A STUDENT: How about lymphatic block? Would that account for the dehydration in the upper half of the body and the edema in the lower half?

DR. CABOT: I am getting a little out of my depth now. I have never known a case of lymphatic block without evidences of tumor. Before they tapped him they would not have felt it, but they should have felt something after they tapped him.

A STUDENT: Do you ever get edema of the upper extremities in cirrhosis? This man had edema of the hands and arms. Doesn't that suggest nephrosis?

DR. CABOT: I have never seen edema of the hands and arms in pure cirrhosis. It seems to go against that diagnosis. It goes perfectly well with nephrosis.

A STUDENT: What about the carious teeth and root abscesses?

DR. CABOT: I omitted that because I think it is of no importance. I think most of our best citizens have conditions like that. It is a point that may be greatly exaggerated.

A STUDENT: Could this be chronic pancreatitis?

DR. CABOT: The only kind of pancreatitis I can diagnose is the acute type. I have never seen any clean-cut clinical picture corresponding to chronic pancreatitis. Pancreatic cancer is diagnosed merely by the symptom of jaundice. I do not see anything about jaundice here.

A STUDENT: Could he have had catarrhal jaundice?

DR. CABOT: Yes, perfectly well so far as I know. But that would not help us at all, would it?

DR. GEORGE W. HOLMES: The first film shows a definite process at the left base. The diaphragm is rather high on that side. The shadow is not very dense and the heart is not displaced. The heart shadow is fairly well outlined and I think well within normal limits. The supracardiac shadow is perhaps a little increased. The aorta is a little tortuous. I do not think there is sufficient evidence to say the aorta is dilated. There may be some arteriosclerosis. A small amount of fluid in the pleural space or even a collapse of the lower lobe might give that picture.

In the second film there is a good deal of rotation which throws the heart to the right. The diaphragm is very high on both sides and the lung fields are somewhat hidden and blurred by motion. In such a film as this there might be more in the chest than appears. There is some dullness at the left base. There could be fluid behind the high-domed diaphragm.

About all we can say is that there are areas of consolidation without saying what it is due to. Such an area as that might be due to a pneumonic process in the lower lobe. It might be infarct or embolus. There is some involvement of the pleura which one would not expect with a simple embolus.

DR. CABOT: Couldn't it be pleural effusion?

DR. HOLMES: Yes, but it is not the character.

Here is a film which shows the frontal sinuses very well. Both antra are perfectly normal.

A PHYSICIAN: What is the difference between the films due to?

DR. HOLMES: I think it may be due either to having the tube off the center or to rotation of the patient. The high position of the diaphragm is probably due to the fact that there is more distortion and partly to the fact that he was lying on his back when that film was taken. In the other film he was sitting up.

DR. WILLIAM B. BREED: I should think it would be very important to decide as to the character of that fluid. It reminds me of a case in the Baker Memorial not yet dead who had chylous ascites of *café au lait* appearance. He also had fluid at the left base exactly similar in character. The right base was entirely clear. We discharged him without a definite diagnosis. It occurred to me that he might have had carcinoma of the thoracic duct. Such a condition has been described, has it not?

DR. MALLORY: Certainly lymphomata there are not uncommon. If it was a thoracic duct

block you ought to be getting fluid with readily demonstrable fat in it. With this pseudochylous fluid fat cannot be demonstrated. What it is due to I do not know. I have seen pseudochylous fluid more than once in cases of renal disease.

DR. EDWARD D. CHURCHILL: In our experience with a case in which we could demonstrate fat globules in the chest fluid it was possible to stain these droplets by giving sudan III by mouth.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Chronic nephritis.

DR. RICHARD C. CABOT'S DIAGNOSES

Nephrosis with nephritis or *X*.
Acute pleuritis.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Subacute glomerular nephritis with tubular degeneration (nephrosis).

2. *Secondary or terminal lesions.*

Cirrhosis of the liver.
Pulmonary embolus.
Acute endocarditis.
Infarcts of the lungs.
Abscess of the lung.
Acute pleuritis.
Thrombosis of the renal veins and (probably) of the vena cava.

PATHOLOGIC DISCUSSION

DR. MALLORY: This is a case on which it was certainly very difficult to make a clinical diagnosis that would check up with the various findings. At autopsy we found a number of different diseases which I cannot connect at all. I take it that most or all of them are of separate etiologies, yet probably each of them played a part in the general picture.

The most obvious lesion anatomically and I think without much question clinically too was the pathology in the kidneys, which clinically had given a suggestive picture of nephrosis. Pathologically we should have to classify it as subacute glomerular nephritis with secondary tubular degeneration. There is an extensive glomerular process, I think primary in spite of the nephrotic symptomatology. It is always dangerous to make a diagnosis of nephrosis in anyone out of childhood unless one does it with the reservation that probably the glomeruli are involved too. I am sure we practically never meet it uncomplicated in adults. Often however the secondary nephrotic element may dominate the clinical picture. I think unquestionably that is true here.

We also found cirrhosis of the liver. It is not an extremely marked cirrhosis but a very definite one. The liver weighs 1600 grams, which is normal in size. It is not atrophic. Histologically I am not able to classify the type. It is consistent with an old alcoholic process; but assuming that his history of not having drunk for the last eight or ten years but having drunk heavily before that is correct, we could not expect to find the specific type of hyalin degeneration we get in the livers of men who have used alcohol within the last year of life. I should therefore be inclined to think this is an old and quite inactive alcoholic cirrhosis.

The immediate cause of death was totally unexpected. It was a massive pulmonary embolus. In view of the rather slow way in which he gave out, there was nothing to suggest that at all. Both pulmonary arteries were completely filled with clot. In searching for a primary thrombotic focus from which the embolus might have broken loose we found thrombosis of both renal veins. We found nothing in the vena cava, yet I think it is almost certain that there was a thrombus in the vena cava at the level of the renal veins and that it broke entirely loose and caused the pulmonary embolus. The small remnants of clot found in the renal vein were in the distal portions of the vessels. Such a process fits well with the clinical finding of edema in the lower half of the body and dehydration above. At least it would help a great deal to explain the picture.

He also had an acute endocarditis of the vegetative type. He had multiple septic infarctions in the lungs and one very sizable abscess. The pleural cavities contained a very small amount of serous fluid at the time of autopsy.

We have three separate diseases which might easily have caused the edema. None of those diagnoses explains very well the very marked and rapidly progressive anemia, which however fits with the bacterial endocarditis.

A PHYSICIAN: Where was the abscess?

DR. MALLORY: In the posterior portion of the left lower lobe, where it shows in the x-ray.

A PHYSICIAN: Is there any evidence as to when that embolus occurred?

DR. MALLORY: I think he unquestionably had a series of emboli, presumably septic emboli, which resulted in these various foci of embolic pneumonia and abscess formation scattered through the lungs and then finally in the last embolus, which was the immediate cause of death. We have had several cases recently where a minor embolus sufficient to cause infarction preceded a fatal major pulmonary embolus by a few days. It impressed me as being something that might be very well worth looking for. Where an infarct of the lung occurs it seems to me that the possibility of a major embolus is good.

A PHYSICIAN: Where was the main embolus?

DR. MALLORY: It lay just at the bifurcation, one end going down each main branch. I can

only guess at the site of formation. The renal arteries were thrombosed. The pulmonary embolus that we found was bigger in circumference than could be accounted for by the thrombosis of the renal veins alone, and showed branches near its midportion. Nothing was left in the vena cava at the time of autopsy. No effort was made to check the exact branching with any anatomic location, but I think that it would probably fit.

A Physician: I understood from the history that the chief symptom at the end was pain.

Dr. Thorp: No. A week before death he had precordial pain. The chief picture was one of prostration.

A Physician: Was that the time the embolus occurred?

Dr. Thorp: The pulse went up at that time, but dropped the following day.

Dr. Mallory: I should guess that at that time he had a small embolus that later developed into an abscess.

Dr. Cabot: Was there any evidence of syphilis?

Dr. Mallory: None that we made out.

CASE 17042

A LESSON IN SURGERY PLUS DIABETES

Surgical Department

PRESENTATION OF CASE

Dr. Richard W. Dwight*: This was a woman of seventy-two who came into the Emergency Ward one evening with a history that she had had a corn on the fourth toe of her right foot for several years. It troubled her very much. She treated it with iodine. A week before she came in the toe suddenly turned black. Her foot had gradually become swollen and more and more painful.

For about a year she had noticed that she was drinking a great deal of water. She had frequency of urination and was forced to get up about twice a night because of it. She lost weight in spite of a good appetite.

Physical examination showed an old woman lying quietly in bed. Her heart was slightly enlarged. Her systolic blood pressure was 178. The artery walls showed evidence of peripheral arteriosclerosis. The right foot was very much swollen and red, with edema going up to about the lower third of the leg. The fourth toe was completely gangrenous. The leukocyte count was 11,500. The temperature was 102° and the pulse 100. The urine showed a slight trace of albumin. Benedict's test for sugar was red.

She was taken immediately to the amphitheatre, where a midthigh operation was done under spinal anesthesia and the flaps closed. The next morning her temperature was down to normal, but she seemed quite sick and also had some râles in the chest. In the afternoon her temperature rose to 104° by rectum. She looked very toxic and seemed comatose. The abdomen was quite distended. The chest showed moist râles on both sides. She was believed to have diffuse pneumonia. The stump looked clean when the dressing was done. The next morning her temperature came down to 102° and then immediately started rising again. She looked considerably worse. Dressing was done again. There was definite evidence of gas in the stump,—crepitation, swelling and redness. The stitches were taken out. It was considered whether she should be taken down to the amphitheatre to make incisions in the leg to open the muscles. Her temperature went up to 106° and she died before anything could be done.

*Junior interne on the West Surgical service.

Clinical Discussion

Dr. Henry H. Faxon: This operation has raised a number of questions in my mind. In the first place I think with these diabetics the decision as to what one is going to do is more important than the technical part of the surgery. Surgery should be done with unusual stress laid on careful, gentle technic, but after all it is the question of what to do that is the most important factor. In a case like this where the diabetes is out of all control, where the infection is not very marked, where twelve to twenty-four hours of careful observation may improve the situation, the present tendency is perhaps to let those hours elapse and see more clearly the problem on one's hands and improve by treatment the diabetic element. Surgery should not be delayed however, according to such men as Dr. Jones and Dr. McKittrick, because of the fact that the patient is a diabetic, if the presenting lesion is one which would call for immediate operation in a non-diabetic. This patient certainly showed an unfavorable picture. True, she did have a very good dorsalis pedis and there was no thrombosis of the vessels in her foot, but she was getting steadily worse despite vigorous treatment of her diabetes. That was my main criterion in not delaying the operation beyond a few hours after first seeing her.

The next problem was at what level to take off the leg. Conceivably in a younger person one might be willing to take considerable risk. But this old and feeble woman would probably never use the stump anyway. For that reason we did a thigh amputation and went high enough to be well above the area of infection. Closure of the stump without drainage has been advocated here right along when the level of the amputation is high enough to be above the area of infection. That was my procedure, done the next morning. It was very gratifying to see her temperature come down and her general appearance improve.

But the next morning when I saw her she

had a high temperature and obvious gas infection. We gave her serum; but I do not feel that it is fair to judge the value of serum from this case because her case was so hopeless. We also considered secondary operation, but believed this would be futile.

In retrospect one other thought goes through my mind. Where did she get the gas contamination of her wound? Dr. Linton has looked up the cases of gas bacillus infection in this hospital and can speak of these better than I. To me it is a terrifying thing to see how gas infection spreads once it is present. Here its progress was a matter merely of hours.

Dr. Robert R. Linton: I am interested in these cases because I have operated upon three. We discovered gas infection in two cases preoperatively. I found three additional cases of it in the hospital records of the past ten years and seven more in the literature, making altogether thirteen. I do not believe it is such a rare thing as these statistics would indicate. I think it simply is usually overlooked.

One of the chief points of interest is, where does the gas bacillus come from? When the operation is done we cut through the clean tissue, and yet gas bacillus infection sometimes occurs. Tanner tried to obtain the organisms from gangrenous areas and also from the blood vessels, but with very little success. We were able to culture it preoperatively in two cases. These showed subcutaneous pockets of gas. It is a well known fact that the gas bacillus is one of the commonest and most numerous inhabitants of the gastro-intestinal tract. Some men say there are a great many strains, most of which are thought not to be very virulent. However, the fact remains that there are gas bacilli in the gastro-intestinal tract normally which are capable of producing typical gas bacillus septicemia. One bacteriologist stated that B. welchii is found in practically 100 per cent of decomposing bodies. That is exactly what a gangrenous foot is of course, and there is no reason why gas bacilli should not be found there. It is important therefore, as Dr. McKittrick has pointed out, that one should be careful in the preparation of the skin at the site to be operated upon, being careful not to contaminate it from the gangrenous area.

Dr. Faxon: It may be of interest to add that immediately after the operation I made a number of incisions in the amputated specimen and was unable to demonstrate gas grossly in any of them.

Dr. Linton: In my recent visit to the surgical clinics of the University of Chicago, Dr. Andrews informed me that he had been able to grow B. welchii from normal dog's muscle. This brings up an interesting point in the etiology, namely, does the same hold true for human muscle?

BACTERIOLOGIC REPORT

Cultures on the specimen removed at operation were positive for gas bacillus.
Blood cultures were negative.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Diabetes mellitus.
Diabetic gangrene.
Gas bacillus infection.

ANATOMIC DIAGNOSES

Amputation of the leg.
Gas bacillus infection of wound.

Pathologic Discussion

Dr. Tracy B. Mallory: At autopsy we found an extensive gangrene of the entire remaining portion of the leg. Practically all its muscles were necrotic and filled with gas bubbles. The area of gross involvement stopped short at the inguinal ligament. On microscopic examination I should estimate that there were more than 100 B. welchii per oil immersion field. That demonstrates the way in which these particular organisms can overwhelm the tissues. The only other organism which is frequently found in the tissues in such numbers is anthrax. There was no evidence grossly of septicemia. In the average case of Welch's bacillus septicemia at autopsy, especially at autopies performed a few hours after death, one can generally count on the liver's being filled with gas bubbles. We did not find anything to suggest it here.

Going back to one of Dr. Linton's points, I think it is always very astonishing to a pathologist or a bacteriologist that this infection is not much more common than it is. The organism, or at least something that we cannot distinguish from it, is an absolutely normal inhabitant of the stools. Dr. Nye some years ago undertook to count the organisms of this type in the intestinal contents. He found something like 50,000 per cubic millimeter in the normal stool, 200,000 in some stools of achlorhydric patients who did not have pernicious anemia and 500,000 in cases of pernicious anemia. There was at one time, as you may remember, a hypothesis that pernicious anemia is due to this increase. To my mind the most probable explanation of the relative rarity of the infection is that here we are dealing with a large group of closely related organisms and that the vast majority of those organisms are of extremely low virulence, possibly none at all. If this were not true it would almost seem that every intestinal operation would necessarily develop gas infection, whereas it is a very rare complication. During the past year we have had, I think, four of them all told. In the average year I doubt if there are nearly as many as that, perhaps one to a year.

Dr. Edward L. Young, Jr.: It seems to me

that there is one other factor that is very important, that is the receptivity of the soil in which the bacteria are placed. Knowing that the B. welchii is a normal inhabitant of the gut, we ought to expect a gas bacillus infection with every appendectomy, for instance, if a person was going to be infected readily. We know that is not the case. Consequently the resistance of the tissue to infection is of very great importance. Of course we know that the presence of sugar in the tissues makes them more susceptible to all types of pathogenic bacteria.

DR. MALLORY: We have evidence that the gas bacillus in its spore stage is among the most resistent to sterilization that we know. Some of the sterilizing measures used in some hospitals are inadequate. Alcohol for instance does not touch B. welchii spores. There was a rather severe epidemic in another hospital seven or eight years ago which Dr. Nye and I reported. We were able to culture gas bacilli from scalpels in the operating room which had been in alcohol for twenty-four hours.

DR. EDWARD D. CHURCHILL: I think the oxygen tension in the tissues may be important in influencing the growth and pathogenicity of this anaerobic or partially anaerobic organism.

DR. MALLORY: I think it is very probable that much the same rule applies as in tetanus. Not only must oxygen be lacking but simultaneous infection with another organism is necessary. Tetanus spores have been injected intravenously into a guinea pig with extreme care not to injure any tissues. The animal was left untouched for a month. Then the tissues were injured by pinching. Within a short time typical tetanic spasms developed.

DR. LOUIS DIENES: It is very interesting that in the observations mentioned by Dr. Linton, which have lately been published, it is reported that not every type of injury to the muscle which contains the gas bacillus will cause the development of the infection. Certain types of injury, such as the injection of bile, are especially favorable to the development of the infection.

DR. JAMES C. WHITE: Your cultures of these tissues are made as a matter of routine for anaerobic as well as for aerobic organisms. How soon would it be possible to let us know whether there is any growth of gas bacillus?

DR. MALLORY: Probably not in less than twelve hours.

DR. CHURCHILL: Don't you think it quite probable that the lymphatic pathways are seeded with bacteria and that one gives them a new foothold by cutting across the lymphatics when the amputation is performed?

DR. MALLORY: Yes, I think that is very probable.

DR. WHITE: We could at least open an amputation stump that was sewed up tight and make a less favorable culture medium by the free exposure of the muscle to the air.

DR. MALLORY: I was interested in hearing Dr. William S. Baer talk here the other night. He has had a few cases of B. welchii infection among his maggot-treated cases and feels that the maggots are of real value in combatting the disease.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 165 Newbury Street.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 165 Newbury Street, Boston, Mass.

"STILLBIRTHS AND NEONATAL DEATHS IN BOSTON"

THE value of statistics depends on so many factors, often undetermined, that they have sometimes been classified as belonging to the group of worst forms of intentional deceit. It is on account of possible inadequacies that conclusions based on statistical investigations should rarely be accepted as proofs, but should be regarded as suggestions looking to an increase in precision in the use of quantitative methods.

The highly interesting, informative and carefully prepared study by Dr. Harold C. Stuart*, properly called by him a "preliminary step", has perhaps its greatest value as a criticism of our methods of criticism. It is a thoroughly orthodox study, but we need sounder methods for determining the efficiency of our endeavors. Of how much good is prenatal care? Every thoughtful person now concedes that it may have some value: but *how much* value does it have? Of how much value is confinement in a hospital? Of how much value is child hygiene? The study has focused attention on a group of cases selected from the total infant mortality of Boston for the year 1929. Of 750 cases in the group selected, 550 were studied by the questionary method, an omission of thirty per cent. of the total because no reports were received concerning them. No proper sampling was possible. Here is an early difficulty in our studies: we cannot get all the returns.

A greater need is to go back of the returns. That is, the returns must be so detailed that they show all the pertinent factors. Some lack is shown in many of the tables in the study. In the group of cases considered, the needed information should include not only medical and nursing care from the time the expectant mother received such care, indicating the period in pregnancy when it was received, but the consideration of social, economic, industrial, occupational and racial influences. If the patient did not receive adequate care, why not, and in what respect was it inadequate? It would be necessary, in the case of an infant death, to secure all the ascertainable pertinent information concerning the influences to which that infant was subjected from the time the mother was aware that conception had occurred, until fetal or infant death took place.

This ideal may seem high, perhaps impracticable now, but it is only by the most intensive studies of this character that we can hope to arrive at the precise information we desire, which is necessary as a basis for intelligent action, and can give support to the compelling arguments which shall stimulate such action. A distinct service has been rendered in showing the inadequacy of our ordinary methods of attempting to collect basic information. It is greatly to be hoped that this "preliminary step" will be followed by others, and that there may result a really adequate study of even a small field in child hygiene.

*See page 149.

STATE MEDICINE

A COMMUNICATION by Dr. G. W. Haigh, of Worcester, on the subject of state medicine will be found on another page of this issue of the *Journal*. Dr. Haigh is a staunch proponent of centralization in medicine, and while we may or we may not, as individuals, agree with his logic, we cannot fail to respect his opinions, and we are glad to present his side of the argument to our readers.

Even in this country there is evident a marked drift towards paternalism—call it bureaucracy or a mild communism or what you will—it is here. We are tending more and more towards a leveling of opportunity and the benefits to be derived from it; a greater sharing of opportunity with the underprivileged classes, and a limitation of opportunity for the more favored ones. This may be just and reasonable, but it carries with it the danger of withdrawal of in-

centive and initiative. It is a question as to how far we are ready for it in our own minds. We are still in a stage of development where the best work is done with a proportionate reward in view. Russia is attempting a complete leveling of opportunity and its benefits, and we are awaiting the outcome of her experiment with deep personal interest—in many minds with apprehension.

Dr. Haigh cites our army and navy medical corps as the examples of centralized medicine, par excellence, which have succeeded. We agree that these are excellent organizations, for the services for which they were designed, but in some minds there exists a doubt as to whether even these unusually efficient organizations would fit the needs of the community as a whole. Even with them the question arises as to whether lack of initiative, due, perhaps, to the absence of proportionate reward, has not hindered the fullest and most effective development of their powers.

The argument that our representatives in Washington have entrusted their own medical welfare to the care of the army and navy officers is a telling one, were it not for the vague and perhaps unworthy suspicion that Congress has simply voted itself another free privilege rather than an endorsement of the Army and Navy Medical Corps per se.

The whole question is complicated and interesting and important, and we should be glad of further enlightenment on its many perplexing problems; the details by which it could be worked out to the satisfaction of all, and particularly the nature of the guarantee that medical standards would continue as high even as their present level.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Metcalf, Carleton R. A.B., M.D. Harvard University School of Medicine 1906. F.A.C.S. Visiting Surgeon, Margaret Pillsbury General Hospital, Concord, N. H., and New Hampshire Memorial Hospital, Concord, N. H. His subject is: "Atelectasis." Page 143. Address: Concord, New Hampshire.

Stuart, Harold C. Litt.B., M.D. Columbia University College of Physicians and Surgeons 1918. Assistant Professor of Child Hygiene, Harvard Medical School and School of Public Health. Assistant Physician, Children's Hospital, Boston. Visiting Physician, Infant's Hospital, Boston. His subject is: "Stillbirths and Neonatal Deaths in Boston 1929." Page 149. Address: 55 Van Dyke Street, Boston.

Sprague, Howard B. A.B., M.D. Harvard University School of Medicine 1922. Assistant Physician, Massachusetts General Hospital. Assistant in Medicine, Harvard Medical School (Courses for Graduates). Visiting Physician, House of the Good Samaritan. Address: 270 Commonwealth Avenue, Boston. Associated with him is:

Graybiel, Ashton. A.B., A.M., M.D. Harvard University School of Medicine 1930. Medical Interne, Massachusetts General Hospital, Boston. Address: Massachusetts General Hospital, Boston. Their subject is: "Salyrgan as a Diuretic. Report of Sixty Cases." Page 154.

Firor, W. M. A.B., M.D. Johns Hopkins University School of Medicine 1921. Formerly Assistant, Instructor and Associate in Surgery, Assistant Resident and Resident Surgeon, Johns Hopkins Hospital. Now Associate Surgeon, Johns Hopkins Hospital. His subject is: "A Review of Crossed Circulation Experiments." Page 157. Address: Johns Hopkins Hospital, Baltimore, Md.

Faxon, Henry H. A.B., M.D. Harvard University School of Medicine 1925. Assistant in Surgery, Harvard Medical School. Staff of Vincent Memorial Hospital. Assistant in Surgery, Massachusetts General Hospital. Member of Peripheral Circulatory Clinic, Massachusetts General Hospital. His subject is: "A New Type of Heated Cradle." Page 160. Address: 264 Beacon Street, Boston.

Cheever, Austin W. A.B., M.D. Harvard 1914. Assistant, Harvard Medical School. Physician, Clinical and Consultant, Department of Skin and Syphilis, Boston Dispensary. Physician, Skin Department, Beth Israel Hospital. His subject is: "Progress in Diagnosis and Treatment of Syphilis, 1929." Page 161. Address: 472 Commonwealth Avenue, Boston.

THE BOSTON MEDICAL LIBRARY

THE EUROPEAN BACKGROUND OF COLONIAL MEDICAL EDUCATION

There was such a conspicuous trek to Europe in colonial days on the part of those who wished to fit themselves for practice in the New World that it would be interesting to know who it was or what it was that attracted them. Adventurous spirits they were who came to this country in the first place, men who were dissatisfied with the conditions under which they lived at home, and it would be strange indeed were there not some among their descendants, possessed of an enquiring disposition, who were willing to go anywhere and suffer any amount of hardship in order to learn how they might ameliorate the physical condition of their fellow colonists. Their ancestors had come over with but poor provision for the care of their ills and as these developed and multiplied those who felt the call to minister to human wants in these respects soon became conscious of the limitations of pioneer communities in providing opportunity for observation and study. They were not slow in concluding that they must retrace their steps

and seek out those who were most conspicuous for their medical accomplishments wherever they were to be found.

England, Holland and Italy chiefly provided what they were seeking at first, and later France and Germany contributed their share. The prominence of Leyden as a medical centre in the 16th and 17th centuries was very great, for she had many teachers of renown, notably Sylvius, Ruysch and Boerhaave. To be under them men flocked from all parts of Europe. At the end of the 16th century there were a half dozen English medical students at Leyden. During the first fifty years of its existence as a Medical School there were graduated 137 doctors of whom 21 were Englishmen. One feature that probably attracted men to Holland was the fact that both at Leyden and at Utrecht were the earliest attempts at bedside teaching in medicine. Just how early it was actually put in practice is not definitely known but it is a matter of record that the question was discussed by the governors of the University of Leyden as early as December 1591. It was probably not long after that it was in operation. Some of the Italian schools, notably those at Padua, Ferrara, Rome, Bologna and Pisa were soon giving instruction in this way, but Germany and England were slow to adopt the method. One of Sylvius' most distinguished pupils was de Graaf who, besides being an anatomist, became known for his early interest in physiology through researches upon pancreatic and parotid secretions which he obtained from sheep by establishing fistulae and making comparative studies of the fluids thus obtained. The importance that was attached in the Low Countries in the 17th century to the study of anatomy is reflected in the large number of canvasses there are in the art galleries of the Netherlands dealing with this subject. These tended to abate popular antipathy to dissection of the human body and made possible an easier procurement of anatomical material for the University schools of medicine. Biological science was beginning to attract attention and the Dutch were soon to achieve distinction. Whether Gallileo or Jansen should be credited with priority in the discovery of the optical principles that resulted in the construction of lenses used in the microscope is not certain, but Jan Swammerdam (1637-1680) in the 17th century, 100 years after Jansen's work, had achieved such prominence through his discoveries in minute anatomy that he was invited by Cosimo de Medici to become professor of the biological sciences at Pisa, which honor he declined. At 21 he had described the red blood corpuscles and at 27 the valves in the lymphatics. A contemporary, though with a much longer span of life, Leeuwenhoek (1632-1723) ground lenses for about 600 microscopes and published over 500 papers on subjects connected with the biological sciences, a number of which found their way to the Royal Society of London and the French Academy of Science. On the practical side of medicine the Dutch were offering a great deal to visiting students. Hendrick Van Deventer, who is known as the father of modern midwifery, was at the height of his reputation at The Hague, being the first to give any accurate description of the pelvis and its deformities together with the bearing of these upon parturition. His colleague, Van Roonhuyze (1525-), was an early contributor to the art of gynecological practice, giving case reports of extrauterine pregnancy, rupture of the uterus and a description of an operation for the cure of vesico-vaginal fistula. In the latter part of the century came Boerhaave and his pupil Cullen, who carried his master's ideas to England and Scotland, and Von Swieten and de Haën, who became the founders of the Vienna School.

In England Willis (1620-75), Wharton (1654), Tyson (1650-1708), Harvey (1578-1657), and Sydenham, either directly or through their pupils, were establishing reputations that drew men from the colonies to the mother country where they gathered ideas, later to become fertile in the establishment of schools destined to supplant the old method of apprenticeship. Willis was an unusually keen observer and to him, beside his anatomical observation upon the cerebral circulation, are to be attributed knowledge of the sweetness of diabetic urine, the designation of puerperal fever and the accurate description of an epidemic of what was probably typhoid fever, occurring in Cromwell's army. Sydenham and Harvey need no comment. Dr. Richard Lower who (1631-91) was the first to transfuse blood direct from one animal to another had also written an important treatise upon the heart. He had made certain observations upon the aëration of venous blood in the lungs, tending to confirm and make complete the work that Harvey had done. John Mayow (1643-79), had suggested the origin of animal heat to be in the muscles and contributed a number of observations in respect to the exchange of gases in respiration, indicating that the science of physiology was likely soon to supply data of great practical value for the physician.

The watch was first used in counting the pulse by Sir John Floyer (1649-1734). Robert Boyle (1627-1691) predicted that some one would some day explain fermentation and that when this was done it would probably have an important bearing upon the treatment of infectious diseases. It was but natural with all these ideas coming to the front that there should be an eagerness to be on the ground where so much was happening. In Italy there were also at this period a number of men who were making observations along medical lines that were to be epoch making in their way, notably Malpighi whose distinction as an anatomist was well known; Pacchioni after whom the bodies of that

name were called; Bellini for whom certain tubules in the kidney were named; Father Kircher (1602-1680), a Jesuit priest, who anticipated the existence of bacteria and suggested the possibility of the transmission of disease by carriers; Sanctorius (1561-1636), a Paduan professor, who was the first to describe the clinical thermometer and the pulse clock.

This sketchy outline of what was going on in Europe in the 17th century as regards the teaching of medicine and the progress of the medical sciences in that day gives a possible explanation of what it was that attracted to European centers those minds who were bound to be dissatisfied with conditions as they existed in their adopted country for the pursuit of their chosen profession. It was but a logical outcome that sooner or later there should be an attempt made to provide, here at home, the facilities which had been sought abroad at such expense of time, effort and money. Later on the renown of the Scottish Schools, particularly that at Edinburgh, made famous by such men as Cullen, Gregory and Black emphasized the desirability of having schools in which opportunity could be offered to those having teaching ability to train the prospective doctor in America who would find it a hardship to go abroad for his education.

MASSACHUSETTS LEGISLATIVE NOTES

In this issue there are copies of several important bills as follows:

House 265 on the petition of Dr. Samuel B. Woodward provides for an act requiring the vaccination of children in private schools and is almost a duplication of previous bills on this subject. The exemption feature is made clear and definite. It will be recalled that this matter has been before the legislature for many years and has been opposed by those who believe that vaccination is a dangerous procedure, that as a compulsory measure it attacks the principle of one's right to protect his body and by Christian Scientists who profess to believe that adherents of a religious belief should be exempted from the application of a law contrary to the tenets of that church.

Several times the bill has been passed in the House but rejected in the Senate and it seemed certain of passage in both houses at one time until it met the opposition of the Governor. Public health officials and the great majority of doctors are hopeful that a legislature, materially changed in its personnel and another Governor may respond to the teachings of medical experience and endorse this bill.

The purpose of House 288 is to abolish the Department of Public Health and put in its place a Department of Public Medicine and Health. It should be noted that one important feature is to provide free medical service to the people of the Commonwealth patterned upon the bureau of medicine and surgery of the United States Navy. This is socialism pure and simple and not in accord with the general medical sentiment in this country.

House 285 relates to the payment of compensation in the Workmen's Compensation Law and should be considered by those giving service to injured workmen.

Senate 58 provides for the application of the tuberculin test to cattle and the creation of modified accredited areas. All who are interested in the elimination of bovine tuberculosis should be interested in this bill.

Senate 69 providing for the Licensing of Local Health Officers and Agents has the endorsement of the State Department of Public Health. The text of these bills follows:

HOUSE—NO. 265

By Mr. Edward J. Kelley of Worcester, petition of Samuel B. Woodward for legislation to require the vaccination of children in private schools. Public Health.

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Thirty-One.

An Act requiring the Vaccination of Children in Private Schools.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Chapter seventy-six of the General Laws is hereby amended by striking out section fifteen and inserting in place thereof the following:—

Section 15. An unvaccinated child shall not be admitted to a public or private school except upon presentation of a certificate signed by a registered physician stating that he has, at the time of giving the certificate, personally examined the child and that he is of the opinion that the physical condition of the child is such that his health will be endangered by vaccination. The said certificate shall state the reasons for the opinion of the physician who signs it. A child from a household where a person is ill with smallpox, diphtheria, scarlet fever, measles, or any other infectious or contagious disease, or from a household exposed to contagion from any such disease in another household, shall not attend any public school during such illness or exposure until the teacher of the school has been furnished with a certificate from the local board of health, or from the attending physician, stating that danger of conveying such disease by such child has passed.

HOUSE—NO. 288

By Mr. Thompson of Newton, petition of Armand C. Bang and Gilbert W. Haigh for the creation of a department of public medicine and health to take over the duties of the Departments of Public Health and Mental Diseases and certain of the activities of the Departments of Public Welfare and Industrial Accidents. State Administration.

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Thirty-One.

An Act to create a Department of Public Medicine and Health, which shall take over the Activities of the Department of Public Health and of the Department of Mental Diseases, and Certain of the Activities of the Department of Public Welfare and of the Department of Industrial Accidents.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 1. There is hereby created and established a department of public medicine and health, hereinafter called the department, for the purpose of furnishing a free and complete medical service to the people of the commonwealth of Massachusetts, patterned upon the bureau of medicine and surgery of the United States navy.

Section 2. The department takes over and assumes all the duties and privileges of the department of public health.

Section 3. The department takes over and assumes all the duties and privileges of the department of mental diseases.

Section 4. The department takes over such activities as refer to medical matters and public and private hospitals now carried on by the department of public welfare.

Section 5. The department takes over all medical activities of the department of industrial accidents.

Section 6. The department takes over and assumes all the activities of all local boards of health and school physicians in the commonwealth.

Section 7. The department shall be administered by a commissioner of public medicine who, while holding this office, shall have the title of medical administrator of Massachusetts. He shall be assisted by a board of five other members of the medical corps as deputy commissioners whose titles while holding this office shall be assistant medical administrators of Massachusetts.

Section 8. The medical administrator and the five assistant medical administrators mentioned under section seven hereof shall be registered physicians or surgeons of at least forty years of age. The first medical administrator and the first five assistant medical administrators to serve under this act shall be appointed by the governor and council for a period of five years after the expiration of which the second and succeeding medical administrators and the second five and succeeding assistant medical administrators shall be selected from the three highest ranks of the medical corps (senior medical directors, medical directors, and medical inspectors) in open and competitive examinations conducted under rules promulgated and established by a board of examiners appointed by the first medical administrator, to serve during good behavior and subject to rules of retirement hereinafter specified. Vacancies shall be filled by the holding of special examinations.

Section 9. There shall be in the department a division of physicians and surgeons, to be known as division A and so referred to hereinafter. One of the above mentioned assistant medical administrators shall be the chief of this division, the personnel of which shall comprise all registered physicians and surgeons practising in the commonwealth, who shall elect to accept and submit to the provisions of this act. From among each one thousand of the personnel of this division, the first medical administrator shall appoint five senior medical directors, forty medical directors, and eighty medical inspectors, total one hundred and twenty-five, one half of whom shall serve for a term of three years and one half for a term of six years, at the expiration of which terms their successors shall be selected from among such members of the personnel of this division as desire to compete for the positions mentioned in open and competitive examinations conducted by the board of examiners, to serve during good behavior and subject to rules of retirement hereinafter specified. Vacancies shall be filled by the holding of special examinations.

Section 10. There shall be in the department a division of dentists, to be known as division B, and so referred to hereinafter. One of the above mentioned assistant medical administrators shall be the chief of this division, the personnel of which shall comprise all registered dentists practising in the commonwealth who shall elect to accept and submit to the provisions of this act. From among each one thousand of the personnel of this division, the first medical administrator shall appoint five senior dental directors, forty dental directors, and eighty dental inspectors, total one hundred and twenty-five, one half of whom shall serve for a term of three years and one half for the term of six years, at the expiration of which terms their successors shall be selected from among such members of the personnel of this division as desire to compete for the positions mentioned in open and competitive examinations conducted by the board of examiners, to serve during good behavior and subject to rules of retirement hereinafter specified. Vacancies shall be filled by the holding of special examinations.

Section 11. There shall be in the department a division of nurses, to be known as division C, and so referred to hereinafter. One of the above mentioned assistant medical administrators shall be chief of this division, the personnel of which shall comprise all nurses registered in the commonwealth who shall elect to accept and submit to the provisions of this act. From among their number the first medical administrator shall appoint the necessary number of superintendents, chief nurses, and head nurses, one half of whom shall serve for a term of two years and one half for four years, at the expiration of which terms their successors shall be selected from among such members of the personnel of this division as desire to compete for the positions mentioned in open and competitive examinations conducted by the board of examiners, to serve during

good behavior and subject to rules of advancement and retirement hereinafter specified. Vacancies shall be filled by the holding of special examinations.

Section 12. There shall be in the department a division of pharmacists and chemists, to be known as Division D, and so referred to hereinafter. One of the above mentioned assistant medical administrators shall be the chief of this division, the personnel of which shall be organized by the first medical administrator on lines similar to those established above for the personnel of division C.

Section 13. There shall be in the department a division of technicians, to be known as division E, and so referred to hereinafter. One of the above mentioned assistant medical administrators shall be the chief of this division, the personnel of which shall be organized by the first medical administrator on lines similar to those established above for the personnel of division C.

Section 14. The department may establish or abolish such other divisons and sub-divisions as it shall deem necessary or advantageous for the promotion of the purposes of this act, and employ and discharge the necessary number of secretaries, clerks, and other assistants, subject to civil service rules.

Section 15. The department shall have charge of the upkeep and operation of all public hospitals and the force employed there; it shall have full supervision of all private hospitals and their employees; it shall advise and have power of supervision with respect to all questions connected with hygiene and sanitation affecting the people of the commonwealth and, to this end, shall have opportunity for necessary inspection; it shall provide for physical examinations of such citizens of the commonwealth as desire it; it shall pass upon the competency, from a professional standpoint, of all members of the personnel of the various divisions of the department, and their promotion, by means of examinations conducted under its supervision or under forms prescribed by it; it shall have power to appoint and remove all nurses of division C; it shall maintain and operate medical supply depots, medical laboratories, hospitals, and dispensaries; it shall require for all supplies, medicines, and instruments used by the department; and it shall have control of the preparation, reception, storage, care, custody, transfer, and issue of all supplies of every kind used in the operation of the department.

Section 16. The main duty and purpose of the department shall be to establish and maintain at all times conditions of as perfect health as it is humanly possible to attain within the population of the commonwealth through preventive measures rather than cure and for this purpose the medical administrator is charged with the distribution of the available personnel of the various divisions in such a manner as will most effectively and successfully accomplish said purpose.

Section 17. The department shall establish a set of rules governing the appointment, promotion, discharge for cause, retirement on account of age or invalidity, hours of duty, sick leave, annual vacations, special vacations for study, and pensions of the personnel of its various divisions with a view to establish within the department a perfect esprit de corps and coöperation.

Section 18. The department shall render free medical and surgical services of all kinds known to science in all cases of sickness, accident, and childbirth, to all citizens of the commonwealth at any time when called upon, including transportation to and from hospital, maintenance in hospital, and all drugs and artificial appliances and limbs, required or deemed advantageous for the speedy restoration of a sick or injured person.

Section 19. Non-citizens of the commonwealth who accept the services of the department shall pay for services rendered at rates established by the medical administrator. Such payments shall be forwarded to the treasurer of the commonwealth who shall credit same to the department.

Section 20. No person connected with the department shall at any time accept a gratuity or present in payment for services rendered hereunder. Acceptance of such gratuity or present shall constitute sufficient cause for discharge.

Section 21. The following schedule of salaries and allowances is hereby established, subject to change by the legislature only, as remuneration of officers and personnel under this act, with the exception of such officers and personnel as are taken over from other departments and whose pay has been already established, as follows (see opposite page):

Senior physicians and senior dentists are members of the medical and dental corps who have served over twenty years. Their annual salary for the twenty-first year is forty-one hundred dollars and increases by one hundred and fifty dollars each year until it reaches the maximum of fifty-six hundred dollars.

Physicians and dentists are members of the medical and dental corps who have served over ten years. Their annual salary for the eleventh year is twenty-six hundred dollars and increases each year by one hundred and fifty dollars until it reaches the maximum of forty-one hundred dollars.

Junior physicians and junior dentists are members of the medical and dental corps during their first ten years of service. Their annual salary for the first year is fifteen hundred dollars and increases by one hundred dollars annually until it reaches the maximum of twenty-four hundred dollars.

The base pay for hospital orderlies and dental hygienists is fifteen hundred dollars for their first year of service and increases by fifty dollars annually until it reaches the maximum of two thousand dollars.

Section 22. The pay of the members of the nurse corps shall be as follows:

During the first three years of service, eight hundred and forty dollars annually;

From the beginning of the fourth year of service until completion of the sixth year of service, ten hundred and eighty dollars annually;

From the beginning of the seventh year of service until completion of the ninth year of service, thirteen hundred and eighty dollars annually;

	Yearly Salary	Allowances *With Dependents* Rental Allowance	*With Dependents* Subsistence Allowance	*Without Dependents* Rental Allowance	*Without Dependents* Subsistence Allowance
Medical Administrator	$10,000	$1,262	$438	$960	$219
Assistant Medical Administrator	8,000	1,262	438	960	219
Senior Medical Director / Senior Dental Director	7,000	1,262	438	960	219
Medical Director / Dental Director	6,000	1,440	438	960	219
Medical Inspector / Dental Inspector	5,750	1,440	438	960	219
Senior Physician / Senior Dentist base pay	4,100	1,440	657	960	219
Physician / Dentist base pay	2,600	1,200	657	720	219
Junior Physician / Junior Dentist base pay	1,500	960	438	720	219
Hospital Orderlies / Dental Hygienists base pay	1,500	480	219	480	219

From the beginning of the tenth year of service, fifteen hundred and sixty dollars annually.

In addition to the above annual salaries each member of the nurse corps shall be paid the following annual allowances: rental allowance, four hundred and eighty dollars, and, subsistence allowance, two hundred and nineteen dollars.

The following officers of the nurse corps shall be paid the following money allowances in addition to their annual salaries as nurses:

Superintendent of nurse corps, twenty-five hundred dollars annually;

Assistant superintendents, directors, and assistant directors, fifteen hundred dollars annually;

Chief nurses, six hundred dollars annually.

Student nurses shall receive free tuition and in addition thereto a yearly money allowance of six hundred dollars besides room and board including uniforms and their upkeep.

Section 23. Rental allowances set forth in sections twenty-one and twenty-two do not accrue to any officer or member of the medical and dental corps and of the nurse corps who are furnished with public quarters. Otherwise the allowances as stated are to be paid in addition to the yearly salary.

Section 24. Members of the medical and allied professions now practising in the commonwealth, and nurses, who shall elect to accept and submit to the provisions of this act shall be entitled to receive such yearly salary and allowances as the number of years they have practised before the passage of this act would have entitled them to had this act been in force at the time of their registration: To illustrate: a physician who has practised in the commonwealth for fifteen full years preceding the passage of this act shall be rated as "physician" and receive a salary of thirty-two hundred dollars for his first year of service hereunder plus allowances as set forth in section twenty-one and annual increases as stipulated.

Section 25. In case a sufficient number of registered members of the medical and allied professions do not accept this act within one year after its passage, the additional number needed shall be obtained by assisting students and prospective students at professional schools and colleges with an annual allowance not exceeding one thousand dollars per year to each student who shall agree to accept this act upon graduation.

Section 26. All expenses incurred under this act shall be paid from the treasury of the commonwealth. Subject to appropriation, the first medical administrator may expend a sum not exceeding one million dollars as preliminary expenses in establishing the organization of the department and apprising the public thereof.

Section 27. This act shall take effect upon its passage.

HOUSE—NO. 285

By Mr. Lane of Lawrence, petition of Thomas J. Lane that employees injured in industrial accidents be compensated during the entire period of total incapacity. Labor and Industries.

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Thirty-One.

An Act providing for the Payment of Compensation under the Workmen's Compensation Law during the Entire Period of Total Incapacity.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section thirty-four of chapter one hundred and fifty-two of the General Laws, as amended by section seven of chapter three hundred and nine of the acts of nineteen hundred and twenty-seven, is hereby further amended by striking out all after the word "dollars" in the eighth line,—so as to read as follows:— Section 34. While the incapacity for work resulting from the injury is total, the insurer shall pay the injured employee a weekly compensation equal to two-thirds of his average weekly wages, but not more than eighteen dollars nor less than nine dollars a week, except that the weekly compensation of the injured employee shall be equal to his average weekly wages in case such wages are less than nine dollars.

SENATE—NO. 58

To accompany the petition of James E. Harper and others for legislation relative to the elimination of diseased cattle from certain areas and to the testing and retesting of bovine animals therein. Agriculture.

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Thirty-One.

An Act relative to the Elimination of Diseased Cattle from Certain Areas.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Chapter one hundred and twenty-nine of the General Laws is hereby amended by striking out section thirty-three B, inserted by section one of chapter three hundred and thirty-five of the acts of nineteen hundred and twenty-seven and amended by section one of chapter one hundred and twenty-three of the acts of nineteen hundred and thirty, and inserting in place thereof the following:—

Section 33B. The director may, upon application for the tuberculin test, made by not less than seventy-five per cent. of the cattle owners owning cattle permanently kept in any city, town, or county other than Barnstable, or in any area composed of contiguous towns or cities in such a county, or upon like application by the owners of eighty-five per cent. of such cattle, declare such city, town, county, or area a quarantine area, and shall proceed to test by the tuberculin test or otherwise all bovine animals within said area. If the director finds and declares that said city, town, county, or area is substantially free from bovine tuberculosis, he shall proclaim it to constitute a modified accredited area and prescribe rules and regulations, subject to the approval of the governor and council, prohibiting the shipment or transportation into the same of any bovine animal without a permit and health certificate issued by the director or some officer designated by the director for the purpose. The director shall have authority to test or retest all bovine animals within said area at such times as he may deem advisable. Whoever violates the terms and conditions of any such quarantine or any such rule or regulation shall be punished by a fine of not more than five hundred dollars or by imprisonment for not more than one year, or both.

SENATE—NO. 69

To accompany the petition of Leslie B. Cutler that provision be made for the licensing of local health officers and agents. Public Health.

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Thirty-One.

An Act to provide for the Licensing of Local Health Officers and Agents.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 1. On and after one year from the date of passage of this act no person shall be appointed as a local health officer, or as an executive or agent of the board of health of any town or city having a population of ten thousand or more, or as the executive officer or agent of any group of towns having a combined population of ten thousand or more, unless he has been licensed as a health officer by the state department of public health.

Section 2. A license as a health officer shall be issued by the state department of public health to each person who passes an examination in sanitation and public health procedures.

Section 3. The examination shall be conducted in such manner and at such times as the state department of public health shall determine.

Section 4. This act shall not prevent any local board of health from continuing in office, without examination and license, any health officer or agent who fills such office at the time of passage of this act.

Section 5. A fee of shall be paid to the state department of public health by the applicant for each examination taken for a license as health officer.

HOUSE—914

Information has come of the filing of House 914 by Mr. Thomas of Fall River, petition of Herbert Lotz for the establishment of a board of registration in chiropractic and relative to regulating the practice thereof. This is somewhat different from previous Chiropractic bills in that it provides that the Surgeon General of the Commonwealth, and the Commissioner of Public Health of the Commonwealth (ex-officiis) and three other members with certain specified qualifications shall constitute the Board. The same arguments apply, in opposition to this bill, as have appeared previously in our columns. The full text of the bill will appear in our issue of January 29.

MISCELLANY

POLYCLINIC HOSPITAL OPENS NEW ADDITION

The new twelve-story addition to the New York Polyclinic Medical School and Hospital on West 50th Street, constructed during the past year at a cost of more than $1,500,000, was formally opened December 29 following a dedication luncheon sponsored by the women's auxiliary of the institution, *The New York World* announces.

The addition will provide ample ward space for teaching and also will provide additional space for clinics. Seven floors will be devoted exclusively to clinics, while four floors are designed for private patients.

The entire tenth floor of the main building has been reconstructed into seven new operating rooms and equipped with the most modern hospital facilities. A lounge and consultation room has been provided for the medical staff.

The Polyclinic was organized in 1881 and its first building was on East 34th Street.

The new addition will increase the capacity of the hospital to about four hundred and fifty patients a day and at the same time permit clinical service to more than six hundred out-patients.

A SUGGESTED TREATMENT OF CANCER

At the Second National Congress of the Italian Anti-Cancer League in Bologna a possible method of combating cancer was suggested by Professor Eugenio Centanni, director of the Pathological Institute of the University of Bologna.

His belief is the result of a number of tests consisting of developing tuberçulosis in animals in which cancer had developed. He claims that cancer and tuberculosis cannot exist together in animals and that each disease is antagonistic to the other.

In the report published in *The New York Times* the statement appears that "cancer could always be conquered by tuberculosis. The animal in these cases was left with a mild non-fatal form of tuberculosis which could be cured".

This treatment has not been applied to cases of human cancer but the expectation of the demonstrations thus far reported is that a new field of study has been opened.

If sufficient publicity follows this announcement there will, in all probability, be volunteers for experimentation and if the cure of cancer is brought about by this method the name of the fortunate patient will be prominent in history.

A COMPARISON OF HEALTH BY GROUPS

The Milbank Memorial Fund, after studying the health reports of 100,000 American men, announces that business men are on the whole healthier than professional men, artisans or farmers. Professional men, however, correct their defects, especially of eyes and teeth, better than do the other groups.

Eight per cent. of professionals and 4.5 per cent. of farmers are troubled with nervousness.

Farmers are freest from nose and throat defects and from chronic skin diseases.

Heart disease occurs more among business men than among the others, and more business men than farmers use patent medicines. The artisans, however, doctor themselves more than do the others.

PROGRESS IN THE GOOD SAMARITAN HOSPITAL CAMPAIGN

The research wing for the Study of Rheumatic Infection for which part of the contributions in this drive for funds for the Good Samaritan Hospital will be applied, will be built this winter. Funds to start the study are already in hand.

This is another effort which added to other accomplishments will make Boston prominent in service to humanity.

THE IMPORTANCE OF VITAMIN B

A statement issued by the State Department of Public Health of Illinois sets forth that a child's intelligence is augmented very decidedly by the use of substances containing vitamin B complex as found in yeast and wheat germ as shown by experimental work on animals and confirmed by results of studies of human infants.

It is alleged that modern methods of marketing have robbed flour of its wheat germ which contains the essential elements for mental growth. The deleterious effect of this loss of vitamin B complex is shown also in the fetal stage.

The change from slow or deficient mental development may be brought about according to their reports by adding yeast and wheat germ to the diet of children. It may be that recess lunch may need to have yeast or wheat germ added to the milk ration. Perhaps intelligence like bodily health may be purchasable.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS, DECEMBER, 1930

The total number of reported cases of communicable diseases for December 1930 is 7633. This is about 2000 more than the figure for November of the same year, but the difference represents the customary rise expected as the result of the winter prevalence of the reportable respiratory diseases.

Anterior poliomyelitis continues somewhat above the usual figure with 31 cases for December.

Diphtheria shows a very definite decline, but half the customary number of cases having been reported for the month.

Epidemic cerebrospinal meningitis shows the usual slight seasonal rise which, by no means, has reached epidemic proportions, only 11 cases being reported for December.

Measles, chicken pox, German measles and scarlet fever all show considerable increases over the preceding month and the same month of the preceding year.

Whooping cough and mumps, on the other hand, have been reported with 488 cases and 263 cases re-

spectively. These figures represent an increase over the preceding month, but a decrease as compared with the figures for December 1929.

Lobar pneumonia, pulmonary tuberculosis and other forms of tuberculosis show the usual expected figure.

Typhoid fever, with 25 reported cases for December, continues low, but is not yet a minimum figure for the month.

Gonorrhea and syphilis with 583 cases and 469 cases respectively are somewhat above the figures reported for the preceding month and considerably above the figures for December 1929.

RARE DISEASES

Anterior poliomyelitis was reported from Belchertown, 1; Beverly, 1; Boston, 11; Lancaster, 1; Malden, 1; Newton, 3; Northfield, 1; Somerville, 1; Waltham, 2; Weymouth, 1; Winthrop, 1; Worcester, 7; total, 31.

Anthrax was reported from Lawrence, 1.

Dysentery was reported from Danvers, 2; Everett, 1; total, 3.

Encephalitis lethargica was reported from Boston, 1; Pittsfield, 1; Springfield, 1; total, 3.

Epidemic cerebrospinal meningitis was reported from Boston, 2; Chelsea, 1; Holyoke, 2; Lowell, 1; Melrose, 1; South Hadley, 1; Waltham, 1; Worcester, 2; total, 11.

Malaria was reported from Chelsea, 1; Foxboro, 4; total, 5.

Pellagra was reported from Boston, 1; Concord, 1; total, 2.

Septic sore throat was reported from Boston, 9; Danvers, 1; Fall River, 1; Greenfield, 1; Holbrook, 1; Somerville, 1; Waltham, 2; Winchendon, 1; total, 17.

Tetanus was reported from Boston, 2.

Trachoma was reported from Boston, 4; Springfield, 1; Watertown, 1; total, 6.

Trichinosis was reported from Boston, 1; Greenfield, 1; Worcester, 1; total, 3.

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES

	Cases in Entire Pop.				Case Rates per 100,000 Pop.		
	Dec. 1930	Dec. 1929	Proso. Index*	Epi. Index†	Dec. 1930	Dec. 1929	Expected Rates‡
All Causes	7633	7219	—	—	179.4	170.5	—
Ant. Polio.	31	9	16	1.9	.7	.2	.4
Diphtheria	348	517	474	.7	8.2	12.2	11.1
Ep. C. S. Men.	11	12	7	1.6	.3	.3	.2
Measles	1280	681	1895	.7	30.1	16.1	44.5
Pneu. Lobar	326	472	432	.8	7.7	11.1	10.2
Scarlet Fever	1024	1177	1418	.7	24.1	27.8	33.3
Tbc. Pul.	320	315	365	.9	7.5	7.4	8.6
Ty. Fever	25	26	16	1.6	.6	.6	.4
W. Cough	488	960	881	.6	11.3	22.7	20.7
Chicken Pox	1842	1425	—	—	43.3	33.7	—
German Measles	139	34	—	—	3.3	.8	—
Gonorrhea	583	400	—	—	13.7	9.4	—
Influenza	28	33	—	—	.7	.8	—
Mumps	263	562	—	—	6.2	13.3	—
Syphilis	469	152	—	—	11.0	3.6	—
Tbc. O. Forms	51	40	—	—	1.2	.9	—

*This index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

†This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the *Boston Medical and Surgical Journal*.

‡Calculated from the Prosodemic Index.

CORRESPONDENCE

RE INOFFENSIVE VS. OFFENSIVE STATE MEDICINE

Editor, *New England Journal of Medicine:*

The program, disclosed by the article upon "Chronic Rheumatism in Massachusetts" in the *Journal* of Dec. 18, 1930, by which the public health department of this commonwealth is insidiously invading the domain of curative medicine can be construed only as an indication of the failure of competitive private practice. When will this fact be acknowledged? Not until the establishment of separate state hospitals for the treatment not only of rheumatism but also of arteriosclerosis, heart disease, diabetes, cholecystitis, et cetera! Surely it is time to halt the multiplication of heterogeneous medical organizations with their sinecures before it may be too late to found a homogeneous service with genuine esprit de corps. Are not the majority of our profession threatened with eventual subjugation by the minority? And a minority controllable by politicians?

Is inoffensiveness, as the authors of that article imply, a justification for that form of state medicine

which would treat primarily those past middle life with incurable afflictions in contrast to another form which would care in addition for those in the prime of life with curable affections. Reason not sentiment must determine the form: courage not diplomacy must mold it.

In the care of the chronic patient the economic factor is recognized by them. Why is it not recognized as an important factor in the early stages of acute diseases, while curable and free from such complications as may add to the physical and mental wrecks of society? Surely things are topsy-turvy when public health officers slight prevention for cure well-nigh futile. Why do the contagious diseases continue to take this toll? And from younger persons! Fundamentally, because of the economic factor. Why do three times the necessary number of people, for the most part sound adolescents and vigorous adults, die of appendicitis? Again, the biggest factor is economic. Why should so many of our fellow-men have lost faith in private doctors of medicine? Once more, it is the economic factor arising out of the frequent discrepancy between the actual values and the monetary costs of services rendered patients.

So, as Dr. Ray L. Wilbur has repeatedly declared, it is a matter of the universal distribution of our knowledge and skill through collectivism. This means more than merely proffering the best possible facilities to any patient who feels constrained to consider whether he should accept them: it means offering them freely to everyone so that he need not hesitate or procrastinate at the possible grave risk to life or limb. How, otherwise, can contagious diseases, too often undiagnosed or concealed, be suppressed? How else can the mortality and morbidity of acute surgical diseases, too often neglected, be reduced? How else can the profession regain the respect and trust of the public?

Our navy and our army settled this problem some time ago. So efficaciously indeed, did they succeed that our representatives in Washington, whose scrutiny and astuteness cannot be denied, have decided to intrust their own medical welfare no longer to private doctors and hospitals but henceforth to the medical officers of the navy and army and the corresponding government hospitals.

To whom, then, can a form of state medicine, patterned upon such a service be offensive? Certainly not to those who will concede that in a democracy in an advanced stage of civilization the people as well as their representatives, soldiers, and sailors are entitled to the best that scientific medicine can furnish in both prevention and in cure.

Yours truly,

G. W. Haigh, M.D.

A TRIBUTE TO DR. DURGIN

January 10, 1931.

Managing Editor, *New England Journal of Medicine.*

Dear Sir:

As the author of the review of "Riders of the Plagues" in our publication, *Health News*, I was particularly interested and pleased to see the excerpt therefrom regarding Dr. Durgin on page 1308 of the December 25 issue of your *Journal.*

Having served under him for eight years, most of the time as director of the Boston Bacteriological Laboratories, I have first-hand information as to the things he accomplished for public health. But as he was of an exceedingly modest and retiring disposition and seldom if ever published or discussed publicly the things which he accomplished, he has failed to receive anywhere near the credit due him. Your excerpt will do much to place credit where credit is due.

Some time ago I wrote for the archives of the American Public Health Association, of which Dr. Durgin was a charter member, an article covering some of the more important instances in his official life. This was published in the *Boston Medical and Surgical Journal* a short time before its name was changed.

Very truly yours,

B. R. Rickards, *Director,*
Division of Public Health Education.
Editor of *Health News.*

DO DOCTORS WANT DISPLAY CARDS ADVISING THE USE OF TOXIN-ANTITOXIN?

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

January 15, 1931.

Editor of the *New England Journal of Medicine:*

The cities of New York and Detroit have recently prepared cards for display in physicians' offices calling the attention of their patients to the advisability of immunizing children against diphtheria.

The Detroit card reads as follows:

To Parents

"I am asked by the Commissioner of Health to call your attention to the importance of having all children between six months and ten years protected against diphtheria with toxin-antitoxin. This is simple, safe and lasting. The doctors are coöperating with the Health Department to wipe out this dangerous disease of children. If you have children who have not yet been protected, please have this attended to."

John Doe, M.D.

If there is a demand for them, the Department of Public Health will be glad to coöperate with the physicians in the Commonwealth in preparing a similar card for display in their offices.

I should appreciate, therefore, hearing from any readers of the *Journal* as to reactions which they may have on the advisability of distributing such cards among physicians in the state.

Yours very truly,

George H. Bigelow, M.D.,
Commissioner of Public Health.

RECENT DEATHS

DWIGHT—Dr. Edwin Welles Dwight died at his home in Marshfield, January 14, 1931, after a long illness with heart disease. He had been Medical Director of the New England Mutual Life Insurance Company since 1902 when he succeeded the late John Homans 2d, and was widely known as an efficient medical director. The son of Henry Williams and Mary Jane Winslow Dwight he was graduated from Harvard Medical School in the class of 1891; he was a house officer, admitting physician and assistant superintendent of the Boston City Hospital and then assistant commissioner of public institutions of the City of Boston. Of later years Dr. Dwight had devoted his time to the insurance company of which he had been assistant director and director. He was a member of the Association of Life Insurance Medical Directors of America, a member of the Union Club of Boston and of the Boston Kennel Club. From 1907 to 1908 he was professor of medical jurisprudence at Tufts College Medical School and published two volumes on "Medical Jurisprudence" and on "Toxicology" respectively. He was a Fellow of the American Medical Association and of the Massachusetts Medical Society.

Dr. Dwight is survived by his widow, Mrs. Laura Napier Dwight.

DUNPHY—Dr. Pierce James Dunphy, visiting gynecologist and obstetrician to the St. Elizabeth's and Boston City hospitals, died of pneumonia at St. Elizabeth's Hospital January 4, 1931, aged 39 years. The son of John J. Dunphy of Worcester he was a graduate of Holy Cross College, Worcester, in the class of 1914 and of Tufts College Medical School in 1918. He settled in Belmont and had an office in Boston, later moving to Brighton. He was an instructor in obstetrics in Tufts College Medical School. During the Great War Dr. Dunphy was a senior grade lieutenant in the Medical Corps of the United States Navy. His death followed a trip to Ayer, Massachusetts, while he was suffering with an attack of grippe, to attend a difficult obstetrical case; he contracted pneumonia which had a fatal termination.

Dr. Dunphy is survived by a brother, Dr. John J. Dunphy, a pediatrician having a Boston office, and a Fellow of the Massachusetts Medical Society.

DOBLE—Dr. Ernest Edgar Doble, a specialist in diseases of the eye, ear, nose and throat, died at his home in Quincy, January 15, 1931, at the age of 73. A native of Solon, Maine, he was graduated at Harvard Medical School in 1882 and settled in general practice in Ipswich, Massachusetts, first joining the state medical society. Later he studied his specialty, moved to Quincy and after that devoted himself to practice in the realm of the eye, ear, nose and throat. He is survived by his widow, Mrs. Elizabeth Bearden Doble.

NEWS ITEMS

THE JAVA FEVER CARRIER—Reports from Java according to the Associated Press are to the effect that Dr. W. K. Mertens of the Health Service claims to have discovered the carriers of the "five-day fever" which is at times epidemic in that country.

These carriers are the Stegomyia fasciata and Aedes albopictus which belong to the mosquito group. The research work on which this result rests was done on volunteers who subjected themselves to the bites of these insects.

THE LAYING OF THE CORNER-STONE OF "THE NEW ENGLAND MEDICAL CENTER"—Dr. Merritt H. Eddy of Middlebury, Vt., will come to Boston to lay the corner-stone of "The New England Medical Center" Building at the corner of Ash and Nassau Streets, Monday, January twenty-six at twelve-thirty o'clock.

Dr. Eddy is the oldest practicing family doctor in New England.

DR. DAVID AYMAN ADDRESSES THE MEDICAL SOCIETY OF BAY RIDGE, BROOKLYN—Dr. David Ayman of Boston addressed the Medical Society of Bay Ridge, Brooklyn, N. Y., January 13, 1931, on "The Early Diagnosis and Early Treatment of Essential (Arteriolar) Hypertension."

A MEDAL BESTOWED ON DR. SIMON FLEXNER—The William Wood Gerhard Medal of the Philadelphia Pathological Society was bestowed upon Dr. Simon Flexner, the Director of The Rockefeller Institute for Medical Research, on January 8, 1931. Dr. Flexner addressed the Society on the subject of "Two Modern Plagues."

NOTICES

RADIO MESSAGES

Courtesy WBZA

Sponsored by the State Department of Public Health

Every Wednesday at 5.20 P. M.

Program ending February 25, 1931.

January 28—"Colds", Dr. Wilson G. Smillie.

February 4—"Infantile Paralysis", Dr. William Aycock.

February 11—"Heart Disease", Dr. Richard Cabot.

February 18—"Age and Cancer", Dr. Shields Warren.

February 25—"The Laboratory in Medicine and Surgery", Dr. William A. Hinton.

The Department of Public Health will tell the radio audience about its various activities every Friday—12:30 to 12:40 P. M.

"Health Forum"

Directed by the State Department of Public Health. Courtesy WEEI every Friday at 4:50 P. M. Queries and Answers will be broadcast.

Questions on health and prevention of disease may be sent to:—"Forum", State Department of Public Health, State House, Boston, Mass.

SPECIAL ANNOUNCEMENT

The Tenth Intensive European Summer Course in Otolaryngology will be given in Vienna, Austria, in the summer of 1931, from June 29 to August 1, under the direction of Dr. George W. Mackenzie. This course is completely rounded out, covering every phase of the subject with opportunity for practical exercises on the cadaver. Instructions will be given by the best men in Vienna, teachers of international reputation. This course will cover 300 hours of intensive instruction in Vienna.

For those taking the course in Otolaryngology arrangements can be made to secure extra operative courses on the eye at an additional cost of approximately $6.00 an hour for two men in a group.

For those taking the course in **Ophthalmology,** arrangements can be made to secure extra operative courses on the ear, nose and throat at an additional cost of approximately $6.00 an hour for 2 men in a group.

In addition to the above program there will be 60 hours of lectures on the boat going to and returning from Europe.

For further particulars address Dr. George W. Mackenzie, 1724 Spruce Street, Philadelphia, Pa.

UNITED STATES CIVIL SERVICE COMMISSION

The United States Civil Service Commission states that it is in need of eligibles to fill the following-named medical officer positions:

Acting assistant surgeon, United States Public Health Service, Galveston, Texas, $3,800 a year.

Acting assistant surgeon qualified in trachoma work, United States Public Health Service, Ellis Island, N. Y., $3,000 a year.

Acting assistant surgeon for work in pathology, United States Public Health Service, Ellis Island, N. Y., $3,600 a year.

Medical officer qualified in neuropsychiatry, Veterans' Bureau, San Francisco, Calif., $3,800 a year.

Junior Medical Officer (Interne)

Applications for junior medical officer (interne) must be on file with the Manager of the Fourth U. S. Civil Service District, Washington, D. C., not later than February 14, 1931.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city.

POSTGRADUATE COURSE, OTO-RHINO-LARYNGOLOGICAL DEPARTMENT, UNIVERSITY OF BORDEAUX

The 8th Annual Postgraduate Course, Oto-rhinolaryngological Department, University of Bordeaux, France, commences July 27, 1931.

A five weeks intensive course for American physicians given in English under the personal guidance of Professor Georges Portmann.

Plastic, Sinus, Transmaxillary, Mastoid, Neck and Goitre Surgery; as well as Bronchoscopy, Laryngoscopy, Oesophagoscopy and Tongue Surgery are the subjects studied.

The course is limited to twelve physicians who act as *assistants* to Professor Portmann in this interesting operative course.

For particulars write to Leon Felderman, M.D., 413 Mitten Building, Philadelphia, Pa.

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P. M., on Thursday, January 29, in the Amphitheatre of the Peter Bent Brigham Hospital, a medical clinic will be given by Dr. Henry A. Christian, to which physicians are cordially invited. These clinics will be held regularly on Thursday afternoons.

REPORTS AND NOTICES OF MEETINGS

THE LYNN MEDICAL FRATERNITY

The "Lynn Medical Fraternity" met at Huntt's Banquet Hall on December 30, 1930 at 8:15 P. M.

The guests of the evening were Dr. Mongan of Somerville and Dr. Lynch of Boston, members of the Committee on Gynaecology and Obstetrics of the Massachusetts Medical Society.

Dr. Mongan outlined the program of the committee with respect to its efforts to promote adequate, competent care for the pregnant and parturient woman in Massachusetts. He also drew attention to the difficulty of drawing reliable conclusions from a comparison of statistical data concerning maternal mortality in different countries on account of varying methods of recording maternal deaths, and also on account of some records representing homogeneous groups while others, as in this country, bring a record of women of diverse national origins including a large colored population nowhere else found in any registration area.

Dr. Lynch spoke on Caesarean section and showed Dr. Phaneuf's moving picture film of this operation kindly loaned by Dr. Phaneuf who was unable to be present.

WM. T. HOPKINS, *Reporter.*

THE ESSEX SOUTH DISTRICT MEDICAL SOCIETY

The Essex South District Medical Society held its regular meeting at Beverly Hospital on Wednesday, January 7, 1931.

At 5 P. M. the following clinical program was presented:

1. Dr. T. H. Odeneal (15 min.): "Relation of Ears to Malnutrition."
2. Dr. G. Randall (10 min.): "Toxic Psychosis."
3. Dr. H. Tolman: "Case of brain abscess operated upon" (recovery).
4. Dr. C. F. Branch: "Pneumonia in utero."
5. Dr. A. E. Parkhurst: "Case of diaphragmatic hernia," "Case of tumor of mediastinum."
6. Dr. P. P. Johnson: "X-rays of kidney, stomach and esophagus."

7:00—Dinner.

Following the dinner a symposium on "Duodenal Ulcer" was held. Dr. Franklin White spoke on the medical aspect, Dr. Arial George on the x-ray and Dr. P. P. Johnson on the surgical aspect.

Attendance 70. Adjourned 10 P. M.

WM. T. HOPKINS, *Reporter.*

MASSACHUSETTS GENERAL HOSPITAL CLINICAL MEETING OF THE STAFF, MOSELEY MEMORIAL BUILDING, JANUARY 8, 1931

Program:

1. Presentation of Cases.
2. Demonstration of Sir Thomas Lewis' cardiac chair bed. Dr. Paul D. White.
3. The use of glucose intravenously in heart failure. Dr. H. M. Marvin, New Haven, Connecticut.
4. Mechanism by which glucose is used advantageously in heart disease. Dr. Roy R. Wheeler.

Discussion opened by Dr. Howard B. Sprague.

The recent meeting at the Massachusetts General Hospital was concerned with some new methods in the treatment of heart disease. This discussion was preceded by the report by Dr. Fuller Albright of a case of Adenoma of the Parathyroid Gland relieved by operation and the report of Dr. Marshall Bartlett of a case of Amebic Cyst of the Liver, recently operated on and being treated by emetine.

Dr. Paul D. White demonstrated the Lawson-Tait bed for the care of patients suffering from cardiac disease, particularly those with orthopnea and edema. This bed was devised by Sir Thomas Lewis about two years ago and Dr. White has just secured one for use at the hospital. It is possible in this bed to raise the head section and also to lower the foot section on a hinge at the level of the patient's knees. This position is very much more comfortable for the majority of patients suffering from cardiac failure and also aids the use of Southey's tubes and other measures for the drainage of dependent edema. The bed fills a very real and practical need. Dr. White also showed pictures of a somewhat similar bed which is being developed with his coöperation by an American manufacturer.

Dr. Harold M. Marvin reported his results with the use of intravenous glucose solutions in heart failure. This method has been used rather widely abroad but he did not become interested in it until the result of such treatment was mentioned to him by Dr. Frank Wilson of Ann Arbor, whose patient recovered unexpectedly after the injection of glucose solution. Dr. Marvin's experience was limited to the treatment of four conditions. (1) Congestive heart failure, (2) Diphtheritic myocarditis occurring in the course of severe faucial diphtheria, (3) Coronary occlusion in which the picture of shock was the outstanding factor, (4) Paroxysmal dyspnea. In the first group, ten cases were reported of whom eight were improved and two showed no change. Of the eight that were improved, three showed a dramatic change for the better coincident with the use of intravenous glucose.

The method was used in the treatment of two children with diphtheritic myocarditis in which defects of conduction between auricles and ventricles and within the ventricles were the striking findings. Prior to the use of glucose, every patient showing this disease had died and there was said to be only one known case of recovery in the literature. The two patients who received glucose recovered.

In the eight cases of coronary thrombosis who were given the intravenous treatment, every one improved and seven are still alive, the longest period being some two and one-half years after the original injection.

Paroxysmal dyspnea was a distressing and frequent occurrence in the six cases to whom Dr. Marvin gave intravenous glucose. The symptom was due to coronary occlusion in most of them. Recovery was complete so far as the paroxysms were concerned in all of these cases, and the effect was very impressive in three of them.

The technique which Dr. Marvin advised was the use of 50 to 100 cc. of fifty per cent. solution of dextrose (Lilly) which is marketed in sterile ampoules with another ampoule containing the buffer solution. The ampoules are warmed and the buffer solution added to the glucose in a 50 cc. syringe and injected intravenously, taking five to six minutes to inject 50 cc. Dr. Marvin stated that he had seen five to six hundred such injections and had observed no unfavorable reactions and had seen only one case in which a thrombosis of a vein had been produced by injections. This was in a patient who was very susceptible to thrombosis.

Dr. Wheeler discussed the probable action of glucose as it applied to cardiac disease and compared it with its effect in other conditions of shock. He noted the low metabolic rate in shock and referred to the work of Thalheimer who showed that it was possible to cause hypoglycemic shock by overstimulation of insulin production by slow injections of glucose. He also favored the belief that the effect of intravenous glucose was to stimulate the so-called "sugar center" of the brain, and to increase the insulin production resulting in an increasing oxidation with the production of heat and water and an increase in blood volume. He felt that such injections were not entirely without danger in that he had seen two cases in which a fatal outcome seemed to have been due to this therapy. One was a patient with a Korsakoff syndrome and the other a diabetic. The finding of

edema of the brain at autopsy suggested the pathologic physiology responsible for death.

The discussion by Dr. Sprague included questions regarding the technique in injection (including the use of insulin in combination with the glucose), the danger of sclerosis of veins, the theoretical disadvantage of overloading the circulation through osmotic effect of hypertonic solution, and the possibility of loss of glucose through rapid diuresis produced by the sugar. The discussion also brought up the question of the effect of intravenous over the oral administration of carbohydrate. Marvin in answer said that the practical advantage overbalanced the theoretical difficulties in the use of glucose and that he had been unable to observe an important loss of sugar through the kidney in spite of rapid injection. He did not believe in its use when diabetes was a complicating factor of heart disease and he had not felt that there was a good basis for the use of insulin with glucose in the non-diabetic cases. The advantage of intravenous use over that of giving sugar by mouth was that it was found almost impossible to make patients take an adequate amount of carbohydrate by mouth. Dr. Marvin was very modest in his claims for the value of intravenous glucose in cardiac failure but the impression given by his striking success was convincing and should stimulate further trial of this therapy.

In conclusion Dr. Marvin stated that if he were confined to the use of only three drugs in the treatment of heart disease he would choose digitalis, morphine and glucose.

NORFOLK DISTRICT MEDICAL SOCIETY

A regular meeting of the society will be held in the Children's Hospital, Boston, January 27, 1931, at 8 P. M. Telephone Aspinwall 5930.

Business:

Communications:

The Acute Abdomen in Children—Dr. W. E. Ladd.

Congenital Oesophageal Atresia—Dr. C. G. Mixter.

Notes on the Use of Uroselectan—Dr. T. H. Lanman.

Observations on the Use of Avertin—Dr. P. Mahoney.

Discussion:

Collation:

It has come to the attention of the secretary that some members have complained that notices of meetings are not being received regularly. If those not receiving notices will please drop the secretary a card it will assist him in keeping the lists true. It is the only check available and would be a great help.

FRANK S. CRUICKSHANK, *Secretary.*
47 Bay State Road, Boston.

THE NEW ENGLAND DERMATOLOGICAL SOCIETY

The New England Dermatological Society will hold its next regular quarterly meeting on Wednesday, February 11, 1931, at the Massachusetts General Hospital, at three o'clock.

RUDOLPH JACOBY, M.D., *Secretary.*

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society will meet January 27, 1931, at 8.15 P. M. in the Amphitheatre of the Peter Bent Brigham Hospital:—

Presentation of Cases.

High Points in the History of Pathology—Esmond R. Long, Professor of Pathology, University of Chicago.

WILLIAM P. MURPHY, *Secretary.*

BELMONT MEDICAL SOCIETY

The next meeting of the Belmont Medical Society will be held in All Saints' Parish House, Belmont, on January 30 at 8:45 P. M. New officers will be installed:

President: William Reid Morrison.

Secretary: Stephen J. Malone.

Speaker for the evening: Dr. Reginald D. Margeson, who will present motion pictures of the Transverse Cervical Abdominal Caesarean Section.

STEPHEN J. MALONE, M.D., *Secretary.*

BOSTON TUBERCULOSIS ASSOCIATION

The annual meeting of the Boston Tuberculosis Association will be held at the Twentieth Century Club, 3 Joy Street, Boston, on Monday, January 26, at 4 P. M. John B. Hawes, 2nd, M.D., President of the Association, will report on the progress of the work. Dr. J. Woods Price of Saranac Lake will give a talk on "Saranac Lake—What It Is and What It Means in the Fight Against Tuberculosis."

ISABEL F. HYAMS, *Clerk.*

THE BETH ISRAEL HOSPITAL PEDIATRIC CLUB

The next regular meeting of the Pediatric Club will take place in the auditorium of the Beth Israel Hospital on Thursday, January 29, 1931.

"Tuberculosis in Children" is the subject to be presented.

Eli Friedman, M.D., will speak on *blood examination.*

Charles Liebman, M.D., will speak on *x-ray interpretation.*

Gabriel Rubin, M.D., will speak on *B. C. G. vaccine treatment.*

RUTH WEISSMAN, *Secretary.*

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

January 23-April 7—Worcester State Hospital, Hospital Staff Luncheons. See page 93, issue of January 8.

January 26—Boston Tuberculosis Association. See notice above.

January 27—The Harvard Medical Society. See notice above.

January 29—Beth Israel Hospital Pediatric Club. See notice above.

January 29—Medical Clinic at the Peter Bent Brigham Hospital. See page 187.

January 30—Belmont Medical Society. See notice above.

February 2—American Heart Association, Inc. See details on page 139, issue of January 15.

February 2-March 30—Lectures on Keeping Mentally Fit. Given under the auspices of the Massachusetts Division of University Extension and the Massachusetts Society for Mental Hygiene. Boston.
Eight lectures, in the Gardner Auditorium, State House, Boston, Monday evenings, beginning February 2, 1931.
Course Leader: Dr. Henry B. Elkind, Medical Director, Massachusetts Society for Mental Hygiene.

February 2—Keeping Mentally Fit: A New Art and Need of the Times. Joseph Jastrow, Ph.D., Formerly Professor of Psychology, University of Wisconsin.

February 9—The Child Is Father to the Man. James S. Plant, M.D., Director, Essex County Juvenile Clinic, Newark, N. J.

February 16—Fatigue, Worry, and "The Blues." Karl M. Bowman, M.D., Assistant Professor of Psychiatry, Harvard Medical School.

March 2—Do We Americans Really Live? James J. Walsh, M.D., Medical Director, Fordham University School of Sociology, and Professor of Physiological Psychology, Cathedral College, New York City.

March 9—The Job and Mental Health. Elton Mayo, Harvard Graduate School of Business Administration.

March 16—Emotion and Intellect in Adult Life. William B. Terhune, M.D., Austen Riggs Foundation, Stockbridge.

March 23—Normal and Abnormal Fear. Abraham Myerson, M.D., Professor of Neurology, Tufts College Medical School.

March 30—"Nerves"; Their Meaning in Our Lives. E. Van Norman Emery, M.D., Medical Director, Connecticut Society for Mental Hygiene.

February 4-June 3—Cardiac Course. See page 854, issue of October 23, 1930.

February 11—The New England Dermatological Society. See page 189.

May 11-14—Meeting of the National Tuberculosis Association at Syracuse. See page 1310, issue of December 25.

July 27-31—Third International Congress of Radiology, Paris. Complete notice appears on page 385, issue of August 21.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

April 16—Taunton Woman's Club.

September 17.

Essex South District Medical Society

Wednesday, February 4—Council meeting, Boston.

Wednesday, February 11—Danvers State Hospital. Clinic at 5 P. M. Dinner 7 P. M. Speaker: Dr. Bryant E. Moulton, Assistant Director of the Judge Baker Foundation. Subject: "Juvenile Delinquency."

Wednesday, March 4—Lynn Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Speakers: Dr. Henry H. Faxon, Boston; subject: Treatment of Varicose Veins and Ulcers by the Injection Method. Dr. Arthur W. Allen, Boston; subject: Neuro Vascular Surgery.

Thursday, May 7—Censors meet at Salem Hospital at 3:30 P. M.

Tuesday, May 12—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. Morris Fishbein, Editor of the A. M. A. Journal of Chicago. Subject: "History of Medical Cults." Ladies invited.

Franklin District Medical Society

March-May—The meetings are held on the second Tuesdays of March and May at 11 A. M. at the Weldon Hotel, Greenfield.

Hampden District Medical Society

January 27—See detailed notice on page 139, issue of January 15.

Middlesex East District Medical Society

March 11—At Reading.

May 13—At Wakefield.

Norfolk District Medical Society

January 27—See page 189.

February 24—Dr. F. C. Irving and Staff, "Difficult Labor Cases and Indications for Interference." Boston Lying-in Hospital, 8 P. M.

March 31—Dr. Arthur W. Allen. Subject to be announced (will deal with circulatory diseases). Hotel Kenmore, 8 P. M.

May—Annual Meeting. Date and details to be announced.

May 7—Censors' Meeting for examination of candidates at 171 Warren Street, Roxbury, 4 P. M. Candidates for schools on accepted list will forward application with certificate of graduation to the secretary at least one week prior to date of examination. Candidates from schools not on accepted list who have been in practice five years will forward applications together with five letters of recommendation from members in good standing in the Massachusetts Medical Society to Dr. P. P. Johnson, Cabot Street, Beverly, Mass., two weeks prior to date of examination. Fee for all candidates $10.00.

FRANK S. CRUICKSHANK, Secretary.

Norfolk South District Medical Society

The meetings for the ensuing year are as follows:
February 5, March 5, April 2, May 7.
All meetings begin at 12 noon. The February meeting will be held at the Quincy City Hospital. All other meetings will be held at the Norfolk County Hospital, South Braintree.
The censors will meet on May 7 at 11:30 A. M. at the Norfolk County Hospital, South Braintree.

NATHAN R. PILLSBURY, Secretary.

Suffolk District Medical Society

January 28-April 29—Combined meetings with the Boston Medical Library. These meetings will be held as specified below on Wednesdays, at 8:15 P. M.

January 28—General meeting in association with the Boston Medical Library at the Boston Medical Library. "The Practice of Medicine in Relation to Public Health Activities." See page 93, issue of January 8.

February 25—Clinical Program, Boston City Hospital.

March 25—Clinical Program, Beth Israel Hospital.

April 29—Annual Meeting. Election of Officers. Boston Medical Library.

The medical profession is cordially invited to attend all of these meetings.

GEORGE S. DERBY, M.D.,
President, Suffolk District Medical Society.
LELAND S. McKITTRICK, M.D.,
Secretary, Suffolk District Medical Society.
HILBERT F. DAY, M.D.,
Boston Medical Library.

BOOK REVIEW

Laboratory Medicine. A Guide for Students and Practitioners. By DANIEL NICHOLSON, M.D., Assistant Professor of Pathology, University of Manitoba. Lea & Febiger, Philadelphia, 1930. Pp. 433. Price, $6.00.

The preface states that "The aim of this book is to provide, in detail, information on the indications, method and interpretation of useful tests that a medical practitioner should be able to perform. It also outlines the principles and interpretation of the more highly technical diagnostic procedures which may be performed for him at a large laboratory." That the book fulfills its aim there can be no doubt. Carefully written, illustrated with over a hundred figures, including many excellent photomicrographs, it should prove to be a handy reference work for the student or technician. It contains, besides, several of the newer laboratory procedures (i.e., the halo method for the determination of the average red cell diameter), the directions for which are to be found only in the original papers. A description of the technique of cisternal puncture might be added to advantage; and, conversely, the pages on clinical indications for various laboratory tests and some of the pages of repetition could well be omitted. If the price could somehow be lowered, the book should have a wide sale.